NATIONAL MUSEUM OF VICTORIA

THE JOURNAL of The Department OF AGRICULTURE

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Issued under the direction of the Hon. E. J. Hogan, M.L.A., Minister of Agriculture.

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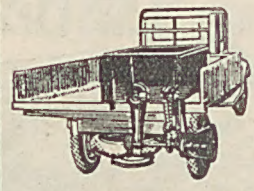

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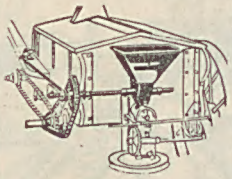

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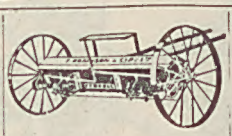

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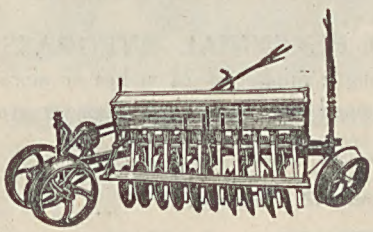

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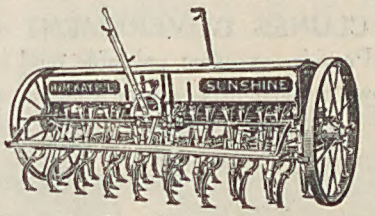

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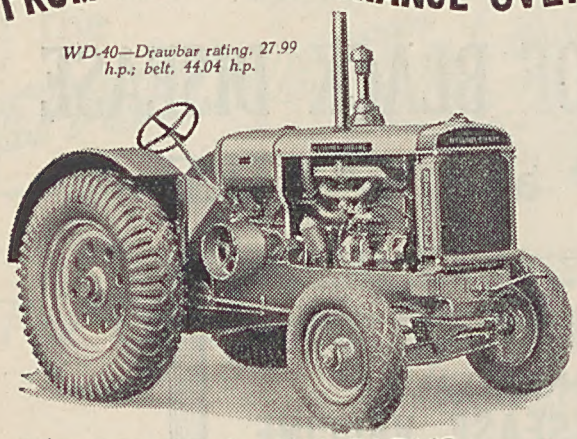

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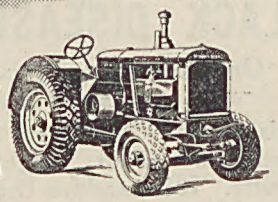

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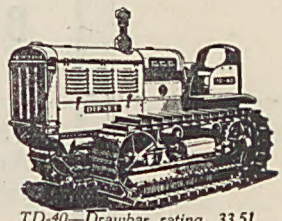

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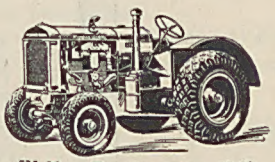

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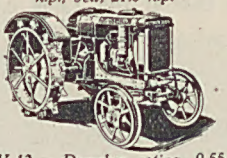

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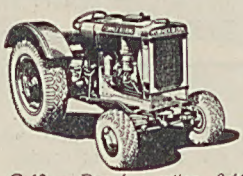

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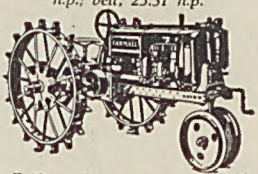

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NATIONAL MUSEUM OF VICTORIA

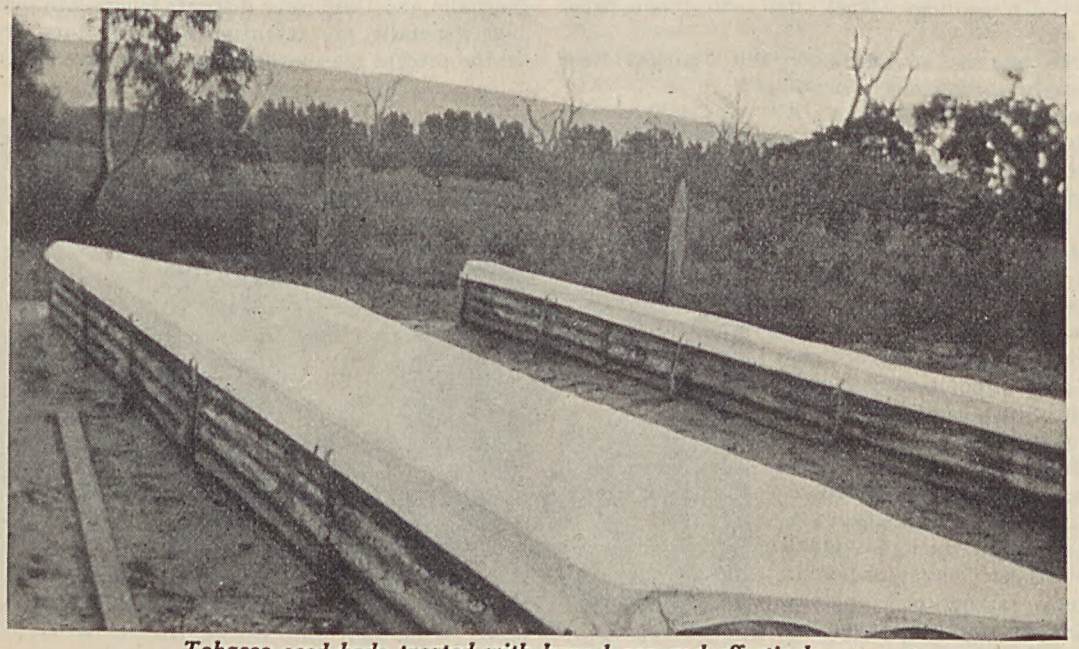
The Journal of the DEPARTMENT of AGRICULTURE of VICTORIA

The Utilization of Benzol in the Tobacco Industry

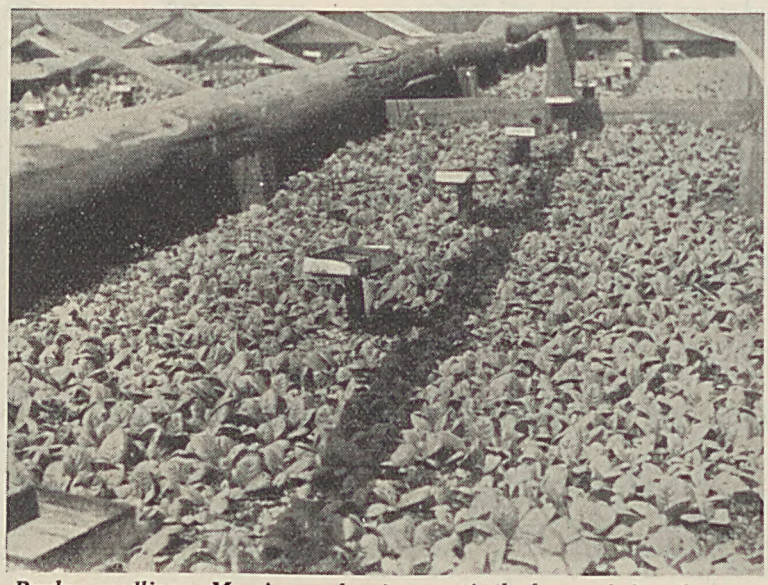
By W. J. B. McDonald, B.Agr.Sc., Inspector of Agriculture

DURING the season 1934–35 the Council for Scientific and Industrial Research developed a technique of raising tobacco seedlings free from mould, by growing them in specially prepared seed beds and subjecting the seedlings during regular periods to the vapors of benzol or some similar hydro-carbon. (See May, 1936, *Journal.*) In the following season 1935–36, the various State Departments of Agriculture within the Commonwealth tested this treatment under their particular local conditions and agreed that the method checked the development of Blue Mould (Downy Mildew) within the seed-bed. The bulk of evidence tended also to support the view that the subsequent growth in the field of seedlings raised under gas was normal.

In Victoria during the present season (1936–37) approximately 5,000 square yards of seed-bed



Tobacco seed-beds treated with benzol gas and effectively covered.



Burley seedlings, Merriang, showing particularly good distribution of seed.

were established under gas by some 50 tobacco growers. By the end of November, 1936, most of Victoria's prepared tobacco acreage was planted, the greater part of it with seedlings raised in the open, but quite a considerable acreage with seedlings raised under gas. The Pomonal district was planted almost wholly with seedlings raised under gas. All seedlings struck well and made rapid growth.

The months of December and January were characterized by long spells of damp humid weather and a great number of tobacco plantations suffered tremendous damage from field attacks of blue mould, so much so that large acreages of tobacco will yield practically nothing. On the other hand, there are occasional plantations which, while not carrying a phenomenal crop in point of yield, will show quite a handsome return per acre.

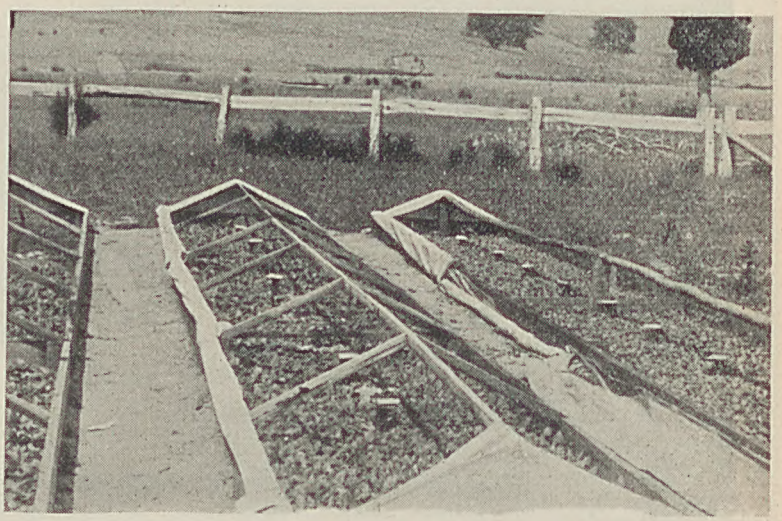
Right throughout the tobacco-growing districts there are pronounced variations in the extent to which individual plantations have suffered. Several factors or combinations of factors have influenced the progress of differing plantations. The most important of these factors in the present season apparently have been as follow :—

Time of Planting.—Generally speaking the early planted crops should yield the most profitable body of leaf. Plantings made during the second and third weeks in October apparently established themselves before mould in the field became particularly virulent, and although some of these showed obvious signs of distress about Xmas time, they mostly possessed sufficient vigor to come away again and produce a fair crop.

Mid-season plantings (November) struck well and made good early growth, but their period of establishment coincided fairly closely with conditions favorable to mould development, and these in the main have suffered badly.

Late plantings still are a doubtful proposition, although at the time of writing many of them are making moderate growth.

The above comments do not apply to the Nathalia and Gunbower districts where late plantings generally are maturing a satisfactory crop. In the present season these two areas have suffered



Showing the gable-ended type of seed beds.

less from mould than any other tobacco-growing district in the State.

Type of Country.—In conditions similar to those holding this season, I regard the heavier class of country as the safest from the point of view of disease infection. In general, it is considered that losses from mould have been most severe on the lighter and more sandy soil types. Areas that in the North-East are regarded as high dry lands—that is country a few feet above river flat level—definitely are carrying the best crops in that district this year. It is necessary to remember, however, that even in a wet year this type of soil must be so located that it is irrigable if the tobacco crop is to be brought to a satisfactory fruition.

Variety.—The variety of tobacco planted probably has exerted the greatest influence this year on the amount of leaf that any particular plantation will yield. The performance of the variety Hickory Pryor, which during the last five years had earned for itself a place of esteem in the minds of many growers, was particularly disappointing this season. With few exceptions Hickory Pryor failed badly in the North-East this year. Under fairly severe conditions last year it produced very well. Last season the main incidence of mould occurred when the crop had made considerably more growth than was the case this year. In addition, the period favoring disease incidence was not so prolonged as it was in the present season.

It would appear that Hickory Pryor will not stand a prolonged attack by mould at or about planting time, although possibly it develops a degree of resistance when well established in the field.

This year Conqueror and Dungowan have proved far superior to Hickory Pryor as a crop yielder. Over a number of years there has been accumulating an undeniable bulk of evidence to the effect that the Dungowan type of tobacco is the safest variety to plant from the point of view of blue mould resistance. Unfortunately Dungowan leaf is not regarded so highly by the buyers as either Hickory Pryor or Conqueror. Under existing circumstances it is considered that growers would be wise to plant half of their contemplated acreage to Dungowan and the remaining half with the variety which past experience has shown to yield the best quality leaf under the particular environmental conditions holding.

Dungowan Selection is a variety of tobacco made available during the past eighteen months by this Department. It resembles Dungowan in general characteristics, is capable of a heavy yield per acre, is fairly resistant to blue mould, and is thought to mature earlier and cure more easily than the old type of Dungowan.

As far as the Department is concerned the selection still is under suspicion with regard to the condition now widely known as "stunting." During the two seasons in which it has been grown this variety has shown a high percentage of "stunts," although in many cases it has been no worse in this respect than Dungowan crops from other sources. In Departmental tests at Pomonal, conducted during 1935–36, Dungowan Selection exhibited a higher percentage of stunted plants than either Conqueror or Warne. Conditions have been so masked by blue mould incidence during the present season that it has not been possible to obtain confirmatory evidence as to this tendency. Despite this weakness, however, it is still capable of yielding a heavy return per acre.

In the foregoing discussion an attempt has been made to point out the main factors contributing to the success or otherwise of any particular crop. Some growers are prone to attribute the failure of many crops to the use of gas on the seed-beds but it is hardly fair to blame the gas for particularly atrocious seasonal conditions. While it is recognized that many crops grown from seedlings raised under gas are a failure, so also are many crops raised from seedlings grown in the open. It can be claimed also that some of the few good crops in the State have been grown from seedlings raised under gas.

It may be that the exceptionally rapid early growth made by this type of seedling re-acted to their disadvantage this year. It may be shown eventually that seedlings raised under gas possess some inherent weakness, but that proof has not been obtained as yet.

Readers are reminded that the gas method of handling a disease problem is an entirely new one, which almost certainly is as yet very crude in its application. Our knowledge of the treatment and its effect on plant life is very meagre. A noteworthy start has been made towards the solution of the mould problem. It is probable that refinements of technique will be required before the main problem and minor ones associated with the treatment are satisfactorily settled. In the meantime growers are advised to refrain from too hasty condemnation of a treatment as yet in its infancy. It is a rather noteworthy fact that those growers who have produced seedlings under gas are its most positive advocates, while the bulk of criticism comes from those growers who have not applied this method to their seed-beds.

Early in the present year the following questionnaire was sent to all known holders of gas type seed-beds. A satisfactory response has been

obtained, about two-thirds of the number having replied up to the present :—

1. Area of seed-beds under gas.
2. Shape of bed adopted—sketch end section.
3. Cost of materials.
   Cost of labour.
4. Quantity of gas used, and kind.
5. Period over which the gas was used.
6. Number and size of evaporating pot used—please quote depth.
7. Was there any appearance of mould ?
8. How many seedlings were obtained and planted out ?
9. What was the percentage strike ?
10. Was growth after transplanting quite satisfactory ?
11. Do you intend maintaining, increasing, or decreasing the area under gas in the coming season ?
12. Did the concentration of gas used by you limit the early growth of seedlings ?
13. Please make any additional comment on the treatment.

The following information has been obtained from an examination of the 30 replies received in answer to the above :—

Area of seed-beds under discussion ..	3,768 sq. yards.
Cost of materials used	£526 7s. 3d.
Cost of labour involved in construction	£176 10s.
[Seven growers did not put a value on labour, claiming it was done in spare time.]	
Quantity of gas used	2,664 gallons of benzol.
[This figure includes 27 gallons of X_3 solvent.]	
Number of seedlings produced	2,232,000
Number of seed-beds in which mould appeared at some stage	8
Number in which mould did not appear ..	22
Number of growers regarding growth after transplanting as satisfactory	27
Number expressing doubt as to growth ..	2
Number regarding growth as unsatisfactory ..	1
Number of growers who intend increasing area under gas	10
Number of growers who intend maintaining area under gas	16
Number of growers who intend reducing area under gas	2
[Two growers not producing tobacco next year.]	
Number of growers who consider concentration of gas used by them limited early growth in seed-bed	10
Number of growers who consider concentration of gas used by them did not limit early growth in seed-bed	20

Practically every grower claimed a strike of over 90 per cent.

Analysing the figures obtained from these replies it will be seen that the average cost of seed-bed construction was 3s. 9d. per sq. yard, while the average cost of constructing frames and supplying benzol totalled 8s. 9d. per 1,000 seedlings produced. This figure of 8s. 9d. does not include the the cost of labour involved in cultivating, weeding, looking after, and picking seedlings, but does include the total capital cost of the beds, a charge which should be spread over a period of years.

Approximately 1 gallon of benzol was used for every 1,000 seedlings produced or, expressing it in a different way, the cost of gas necessary to protect 1 sq. yard of seed-bed was 17·6 pence. The average yield of seedlings proved to be just under 600 per sq. yard.

Subjecting to analysis the figure of 3s. 9d., which proved to be the constructional cost per sq. yard, it was found that the cost of the seed-bed covers absorbed 1s. 1d. of this amount, leaving a figure of 2s. 8d. to cover other constructional charges. If this cost of 3s. 9d. were spread over a period of three years, quite a modest estimate of the life of a sea-bed, the annual cost per yard would equal 1s. 3d. Anticipating that covers may have to be renewed yearly, maintenance costs also would approximate 1s. 3d. per yard, making a seed-bed charge of 2s. 6d. per yard. If the cost of supplying gas (at 2s. 1d. per gallon) remains stationary at 17·6 pence per yard, the average cost of growing seedlings under gas, excluding labour charges, would equal approximately 4s. per yard which, at 600 plants per sq. yard, would total 7s. 8d. per 1,000.

In the season just past many growers produced seedlings under gas at a figure very much less than 8s. 9d. per 1,000. In these cases the beds were constructed of bush timber and scrap material available round the farm, but providing proper care in fitting the covers was exercised results in these cheap structures were just as satisfactory as in the more expensive frames.

Burnley Egg-Laying Competition

Results of 1936-37 Test

By H. F. Clinton, Poultry Expert

Mr. G. E. Thomas' White Leghorn, winner of section B, Class 2, with a total of 276 eggs.

THE twenty-sixth Egg-laying Competition for fowls, and the ninth for ducks, conducted at the Burnley School of Primary Agriculture and Horticulture, commenced on 1st April, 1936, and concluded on the 2nd March, 1937, a period of 48 weeks.

The results obtained in Egg-laying Competitions throughout the world have demonstrated the possibilities of improving the average egg production on commercial poultry farms, and competitions carried out by State Governments render a very distinct service to the poultry industry, since, as they are officially conducted, the records are accepted as official. Many competitors have appreciated this fact and have sent birds to the Burnley Egg-laying Competitions for a great number of years.

Recently, consideration has been given to a suggestion that the results of Egg-laying Competitions conducted by the State Governments of Australia should be published in a uniform manner. This would facilitate comparisons, and for that reason it is hoped that uniformity will be achieved in the near future. There is no doubt, also, that more valuable information could be obtained from these tests than is the case at present. This also deserves consideration. The question of investigating the cause of mortality is a case in point. The educative value of this and other important investigations would be considerable.

In this competition, prize certificates and sashes were awarded for the greatest number of first-grade eggs laid. During the first two months of the competition a first-grade fowl's egg must have weighed not less than 1¾ oz., and thereafter not less than 2 oz. From the beginning of the competition no duck's egg was classed as first grade unless it weighed at least 2 oz.

In the Burnley Egg-laying Competitions every egg is weighed and recorded to one-tenth of an ounce. This division of an ounce has been found to be most satisfactory, as the scale is easily and quickly read and it greatly simplifies the clerical work involved. These records are available for examination by any competitor who can thus compare the performances of various birds, and, if he wishes, ascertain the weight of every egg laid by his birds throughout the period of the competition.

In this year's competition, all the pens for fowls were filled, a most notable feature being the increase in popularity of Rhode Islands. There were 72 Rhode Island Reds entered. This is the highest number for this breed that has competed in any Burnley Competition, and constituted sufficient entries to provide for special classes for these birds.

Although wet weather above the average was experienced during the first four months of the competition, and also during a portion of the summer months, conditions throughout the 1936–37 test were favorable for egg production. There was no continuous heat during the summer, and no deaths were recorded through heat apoplexy. There was a great improvement in the

average number of eggs produced by the fowls compared with that of last year, while a highly satisfactory increase was recorded in the average number of first grade eggs, as can be seen from the following table :—

AVERAGE NUMBER OF EGGS LAID PER BIRD.

Competition.	First Grade.	Underweight.	Total.
1935–36 ..	176·8	7·8	184·6
1936–37 ..	183·7	4·4	188·1

Another pleasing feature was the increase in the number of prize certificates and certificates of merit awarded, there being 57 more than for the previous competition. In the classes for Australorps, there was a very noticeable increase of 27 over the previous year.

The table in the next column setting out the percentages of first grade eggs, underweight eggs, mortality, &c., during the past 12 years is also of interest.

SHOWING THE IMPROVEMENT IN PERCENTAGE OF FIRST-GRADE EGGS, 1925–26 TO 1936–37.

Year.	Percentage of 1st Grade Eggs.	Percentage of Underweight Eggs.	Average No. of Eggs per Bird.	Percentage Mortality.
1925–26 (365 days)	79·8	20·2	206·3	5·4
1926–27 (48 weeks)	86·0	14·0	202·3	3·9
1927–28 ,,	88·4	11·6	197·8	4·2
1928–29 ,,	90·8	9·2	199·0	6·7
1929–30 ,,	89·9	10·1	187·3	4·3
1930–31 ,,	90·3	9·7	193·3	6·4
1931–32 ,,	92·6	7·4	195·2	5·1
1932–33 ,,	93·6	6·4	189·9	5·5
1933–34 ,,	93·5	6·5	185·1	7·7
1934–35 ,,	94·7	5·3	186·4	6·4
1935–36 ,,	95·8	4·2	184·6	8·9
1936–37 ,,	97·6	2·4	188·1	6·1

It is most pleasing to be able to state that the extent of mortality amongst the competing birds was lower than it has been for the past four years. There were eighteen less deaths recorded amongst the fowls this year than in the 1935–36 competition.

Teams of Six.

The principal feature of the competition just concluded was the outstanding performance of a

STATEMENT SHOWING THE NUMBER OF EGGS LAID BY THE VARIOUS BREEDS IN THE COMPETITION, AND THE AVERAGE NUMBER OF EGGS LAID PER BIRD.

Breeds.	No. of Birds.	Eggs Laid.			Average Number of Eggs Laid per Bird.		
		1st Grade.	Under Weight.	Total.	1st Grade.	Under Weight.	Total.
LIGHT BREEDS—WET MASH—							
White Leghorns	257	48,288	1,215	49,503	187·9	4·7	192·6
Black Leghorns	8	1,178	133	1,311	147·3	16·6	163·9
Brown Leghorns	12	1,803	62	1,865	150·2	5·2	155·4
Anconas	2	273	4	277	136·5	2·0	138·5
TOTAL LIGHT BREEDS—WET MASH	279	51,542	1,414	52,956	184·7	5·1	189·8
LIGHT BREEDS—DRY MASH—							
White Leghorns	104	19,056	445	19,501	183·2	4·3	187·5
TOTAL LIGHT BREEDS—WET AND DRY MASH ..	383	70,598	1,859	72,457	184·3	4·9	189·2
HEAVY BREEDS—WET MASH—							
Australorps	171	33,131	740	33,871	193·8	4·3	198·1
Rhode Island Reds	69	11,194	243	11,437	162·2	3·5	165·7
Light Sussex	8	1,282	2	1,284	160·3	0·2	160·5
Barnevelders	2	244	2	246	122·0	1·0	123·0
Partridge Australorps	8	1,285	21	1,306	160·6	2·6	163·2
TOTAL HEAVY BREEDS	258	47,136	1,008	48,144	182·7	3·9	186·6
TOTAL ALL BREEDS—WET AND DRY MASH ..	641	117,734	2,867	120,601	183·7	4·4	188·1

The "Australpar" (Mr. H. Shaw) team of Partridge Australorps, winner of Class 5 (996 eggs).

team of six Australorps entered by the "Belvedere" Poultry Farm, Tasmania; these birds laid 1,522 first-grade eggs in the 336 days of the test.

In Section A, Class 1, White Leghorns, Wet Mash, "Ruburina" (Mr. V. D. Wallington) was first with a team that laid 1,375 first-grade eggs—the highest score for White Leghorns. This team comprised a splendid lot of strong typical birds of a good size and excellent quality, and laid consistently throughout the competition. The eggs were of a good size, excellent in shell texture, and specially suitable for export. A brother of this team won at the last Melbourne Royal Agricultural Show. Mr. P. C. Thomson was awarded second place; his team laid a total of 1,267 eggs. Mr. J. M. Sutherland followed closely with a team that laid 1,264 eggs.

In Class 2, White Leghorns, Dry Mash, first prize went to the Sorrento Farm with a team that laid 1,272 first-grade eggs. These birds were of a good vigorous quality, and put up a very good performance. "Ruburina" (Mr. V. D. Wallington) was second with 1,257 eggs, and "Wywurry" (Mr. L. Magnusson) a close third with 1,253 eggs. In Class 3, All Light Breeds, other than White Leghorns, the highest score was made by a team of Black Leghorns owned by the Sorrento Farm. This team laid 833 first-grade eggs; Mr. D. Granter's team of Brown Leghorns was second with 819 eggs. Unfortunately neither of these teams laid the number of eggs required to qualify for a prize, although some of the individual birds laid well.

In Class 4, Australorps, the team owned by the "Belvedere" Poultry Farm (Mr. E. W. Lacy, Tasmania) was first with a total of 1,522 first grade eggs. This was the highest score recorded in the competition. These birds were of excellent quality and finished in very good condition. They differed slightly from most local strains, being not quite so large, neater in appearance, and very tight in feather. They laid consistently throughout the competition, and the eggs were of a good size, excellent in shell texture, and most suitable for the export trade.

Mr. T. L. Eastaugh, who has been very prominent amongst the winners for a good number of years, was second, his birds having laid a total of 1,379 eggs. Unfortunately, one of his birds met with an accident, and as it was out of action for some time, this somewhat reduced the number of eggs laid. Mr. F. W. Greenfield's team followed closely for third place with 1,368 eggs. Two birds in this team laid 283 and 279 eggs respectively, the highest number recorded for individual birds in Section A.

In the Class for Heavy Breeds, other than Australorps and Rhode Island Reds, a team of Partridge Australorps entered by "Australpar" (Mr. H. Shaw,) laid 996 first-grade eggs, only four eggs less than the number required to qualify for a prize.

The winning team in the Class for Rhode Island Reds was that of Mr. J. Rankin, the number of first-grade eggs laid being 1,111. This team did remarkably well to have laid so many eggs as they were very young when received, and the first bird to lay did not do so until 29th April, while the last to commence laid her first egg on 31st May. They were of a good type, and laid beautiful eggs of a large size, and excellent in shape, colour, and texture of shell. Mr. W. Tedstone's team took second place with 1,061 eggs, and that of Mr. S. N. Lloyd, third with 948 eggs, the number of eggs laid by the latter team not being sufficient to qualify for a prize, although one of the birds laid a good number of eggs.

Individual Birds.

In Section B, Class 1, White Leghorns, Wet Mash, the winner was a bird entered by Mr. G.

McDonnell, who has been one of the most successful competitors at Burnley for many years. This bird, a strong typical Leghorn of a good size and excellent quality, laid a total of 274 first-grade eggs. A bird belonging to Mrs. J. Thomas was placed second, with a total of 271 eggs, while third place was secured by Mrs. M. G. Occleshaw with a bird that laid 270 eggs. It is interesting to note that several birds in this class finished remarkably close to one another.

In Class 2, White Leghorns, Dry Mash, first place was won by Mr. G. E. Thomas whose bird laid 276 first-grade eggs, the highest score for an individual White Leghorn. This bird was an excellent specimen of the breed, with a very good head, and finished in a good strong condition. Second place was taken by a bird owned by Mr. T. J. Stevens, and third by one entered by Mr. G. E. Thomas, the totals being 255 and 253 respectively.

First place in Class 3, All Light Breeds, other than White Leghorns, was awarded to a Brown Leghorn belonging to Mr. Don Granter; her total was 224 first-grade eggs. This bird was of good quality, and the eggs were a nice size and even in texture of shell. A Black Leghorn owned by the Sorrento Farm was second, and a Brown Leghorn entered by Mr. F. Boyle third; the totals were 177 and 176 respectively, unfortunately not high enough to qualify for a prize.

In Class 4, Australorps, the two leading birds, owned by Mrs. W. Savory and Mr. C. H. Harvey respectively, were equal for first place, each having laid 286 first-grade eggs, the highest score in the competition for individual birds. The one entered by Mrs. W. Savory was a good bird of nice quality, and that belonging to Mr. C. H. Harvey was a strong type of hen, very active, and laid eggs of a good size, colour, and texture of shell. Mr. W. Drinkwater's entry was third with 269 eggs.

In the Class for Heavy Breeds, other than Australorps and Rhode Island Reds, Mr. C. J. Coulson secured first place with a bird that laid 217 first-grade eggs. This was a good score and only just missed qualifying for a prize by three eggs. This bird was a typical Light Sussex and showed little tendency towards broodiness. Mr. Coulson secured second place also with another Light Sussex that laid 198 eggs, and Mr. H. R. Cropley was third with a Light Sussex that laid 188 eggs, but the number of eggs laid by these two birds did not qualify them for a prize.

Mr. G. D. Lockhart was first in the Class for Rhode Island Reds; his bird laid 252 first-grade eggs. This bird was of a good size, type, and colour, with a nice head, very active, and laid eggs of a nice colour. Mr. Lockhart's birds have put up a very fine performance, as this is the third year in succession that they have won at

Australorps, owned by—left, Mrs. W. Savory right, Mr. C. H. Harvey, which were equal first in Class 4 with 286, first grade eggs.

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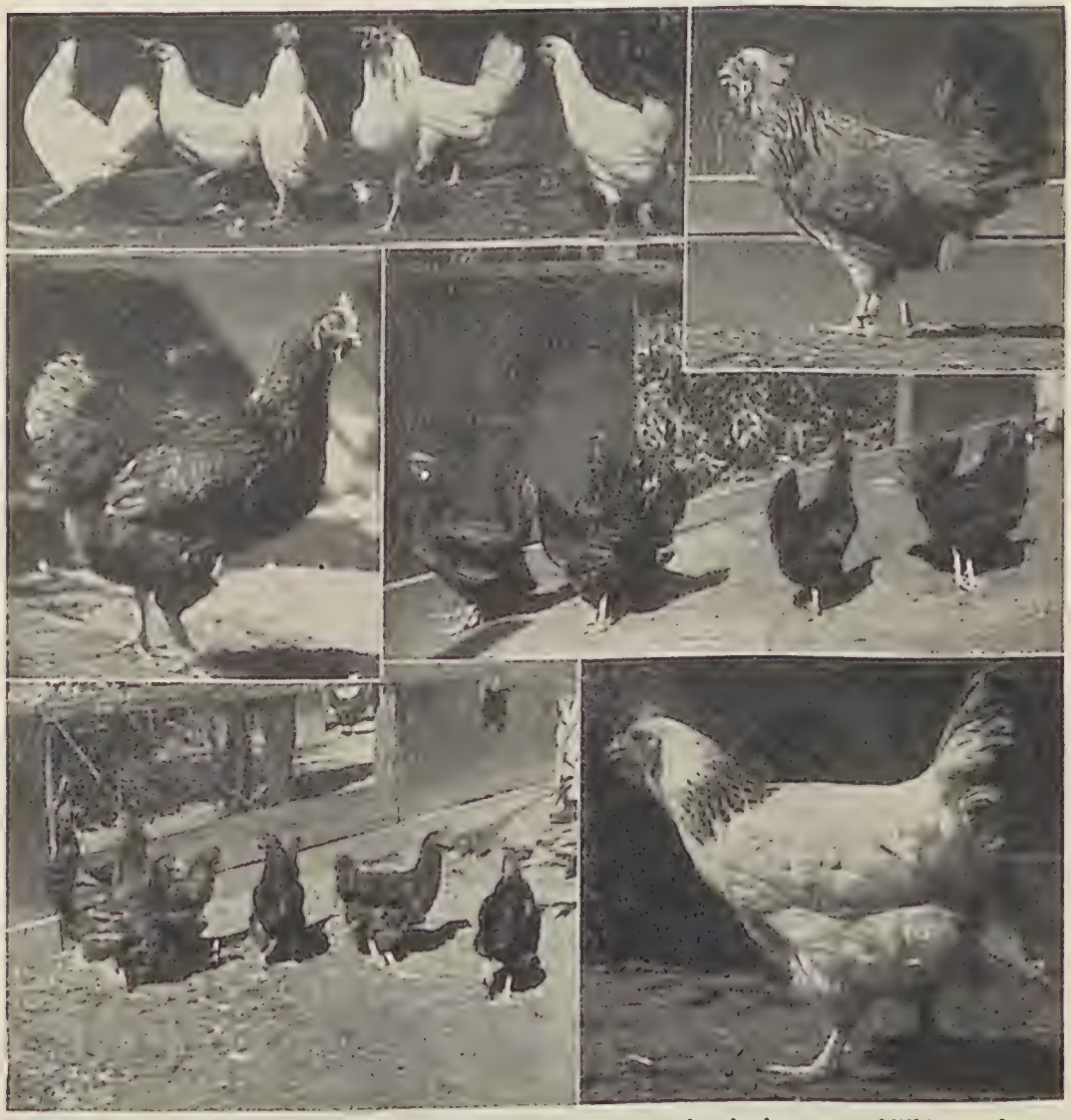

Top left, "Ruburina" (Mr. V. D. Wallington) Poultry Farm's winning team of White Leghorns (1,375 eggs); Top right, Mr. D. Granter's Brown Leghorn (224 eggs); Centre left, Mr. G. D. Lockhart's Rhode Island Red (252 eggs); Centre right, Sorrento Poultry Farm's Black Leghorns (833 eggs); Lower left, Mr. J. Rankin's winning Rhode Island Red team (1,111 eggs); Lower right, Light Sussex owned by Mr. C. J. Coulson (217 eggs).

the Burnley Competitions in the Class for Rhode Island Reds. Last year his bird laid 253 eggs, and the year before another bird owned by him laid 251 eggs. Second place was secured by a Rhode Island Red owned by Mr. W. Todstone that laid 247 eggs, only five eggs behind the winner. Miss M. Dewar and Mr. A. A. Cleve were equal third with Rhode Island Reds, each bird having laid 221 eggs.

Cost of Feeding, &c.

The number of fowls in the competition at its beginning was 656, but 40 of these died. The total number of days these latter birds collectively were in the pens was 8,328, which is equal to approximately 25 birds having been there for the full 48 weeks. Therefore, the total number of birds in the competition for the whole period may be regarded as 641, and this is the figure

White Leghorn, owned by Mr. G. McDonnell, which laid 274 eggs (wet mash).

that has been used when working out averages, &c.

The different kinds and quantities of the food fed to the birds during the currency of the competition were as follows:—Wheat, 23,262 lb.; hulled oats, 5,378 lb.; maize, 5,299 lb.; bran, 12,930 lb.; pollard, 18,146 lb.; oat pollard, 115 lb.; maize-meal, 178 lb.; dried buttermilk, 495 lb.; meat-meal, 312 lb.; meat, 3,508 lb.; onions, 542 lb.; salt, 110 lb.; grit, 3,508 lb.; charcoal, 413 lb.; krafco, 336 lb.; molasses, 280 lb.

The total number of eggs laid, including those underweight, was 120,601, an average per bird of 188·1 for the 48 weeks.

The average price realized for the eggs over the 48 weeks of the competition, approximately 1s. 1d. per dozen, and the market value of the eggs laid, 16s. 11¾d. per bird, were higher than has been the case since the 1930–31 competition, when they were 1s. 1¼d. per dozen, and 17s. 9½d. per bird respectively. Although the cost of food, 8s. 3d. per bird (a fraction over 2d. per week), was the highest since 1929–30, when it was 10s. 2¼d. per bird, the profit over cost of food, 8s. 7¼d. per bird, was higher than it has been since 1931–32, when it was 9s. 3d. per bird. The prices received for the eggs, however, are the net prices, exclusive of freight or commission charges. Also, it must be remembered, that the eggs were laid by pullets in their first period of production, which were kept in single pens or in teams of six, the conditions being entirely different from those on commercial poultry farms where birds of various ages are kept in large flocks.

The successful results achieved in the competition pens are due to good feeding and management, and the high average production of eggs of good quality, size, shape, colour, and texture of shell, from birds of high quality and constitutional vigor. When birds of this description are returned to their owners they can be used to breed stock of the highest class. That there is a keen demand for birds of the right kind is shown by the very high prices that have been paid for the best stock entered in the Burnley Egg-laying Competition. Owners of commercial poultry farms, by introducing birds of this description amongst their flocks, no doubt would greatly improve the average egg yield and reduce the percentage of mortality on the farm.

Competitors entering birds are advised to select only pullets bred from strong robust parents that have not suffered an illness of any description. It is only those birds bred with a high degree of constitutional vigor that can produce progeny which stand the strain of high egg production over a long period.

SECTION A.—TEAMS OF SIX BIRDS, TRAP-NESTED.

Pen No.	Name and Address.	Total Eggs.	Underweight.	First Grade Eggs.
	Class 1.—White Leghorns—Wet Mash.			
	First Prize—Champion Certificate; also Third Prize—Burnley Sash.			
20	"Ruburina" (V. D. Wallington), Nell-street, Greensborough	1,377	2	1,375
	Second Prize—Government Certificate.			
25	P. C. Thomson, 142 Fyans-street, South Geelong	1,273	6	1,267
	Third Prize—Government Certificate.			
24	J. M. Sutherland, Fulton-road, Box Hill	1,278	14	1,264
	Class 2.—White Leghorns—Dry Mash.			
	First Prize—Champion Certificate.			
39	Sorrento Farm, Campbell-road, Sorrento	1,284	12	1,272
	Second Prize—Government Certificate.			
38	"Ruburina" (V. D. Wallington) Nell-street, Greensborough	1,257	..	1,257
	Third Prize—Government Certificate.			
43	"Wywurry" (L. Magnusson), Private Bag, Nathalia	1,279	26	1,253

Section A.—continued.

Pen No.	Name and Address.	Total Eggs.	Under-weight.	First Grade Eggs.
	Class 4.—Australorps—Wet Mash.			
	First Prize—Champion Certificate; also Burnley Champion Sash.			
70	Belvedere Poultry Farm (E. W. Lacy), Fern Tree, via Hobart, Tasmania	1,532	10	1,522
	Second Prize—Government Certificate; also Second Prize—Burnley Sash.			
56	T. L. Eastaugh, Pt. Nepean-road, Highett, S.21	1,385	6	1,379
	Third Prize—Government Certificate.			
57	F. W. Greenfield, Goodwin-street, Blackburn	1,413	55	1,368
	Class 5.—Rhode Islands—Wet Mash.			
	First Prize—Champion Certificate.			
50	J. Rankin, 14 Freeman-street, Balwyn, E.8 (R. I. Reds)	1,115	4	1,111
	Second Prize—Government Certificate.			
51	W. Tedstone, Whitehorse-road, Balwyn, E.8 (R. I. Reds)	1,061	..	1,061

SECTION B.—INDIVIDUAL BIRDS, SINGLE TEST.

Pen No.	Name and Address.	Total Eggs.	Under-weight.	First Grade Eggs.
	Class 1.—White Leghorns—Wet Mash.			
	First Prize—Champion Certificate.			
44	G. McDonnell, 46 Childers-street, Kew, E.4.	274	..	274

Section B.—continued.

Pen No.	Name and Address.	Total Eggs.	Under-weight.	First Grade Eggs.
	Class 1—continued.			
	Second Prize—Government Certificate.			
90	Mrs. J. Thomas, "Hillside," Outtrim	271	..	271
	Third Prize—Government Certificate.			
59	M. G. Occleshaw, "Lauriston," Warrandyte-road, Ringwood	270	..	270
	Class 2.—White Leghorns—Dry Mash.			
	First Prize—Champion Certificate; also Third Prize—Burnley Sash.			
231	G. E. Thomas, "Rosanna," Chesterville-road, Cheltenham, S.22	276	..	276
	Second Prize—Government Certificate.			
229	T. J. Stevens, 309 Darling-street, Ballarat	265	10	255
	Third Prize—Government Certificate.			
232	G. E. Thomas, "Rosanna," Chesterville-road, Cheltenham, S.22	253	..	253
	Class 3.—All Light Breeds other than White Leghorns—Wet Mash.			
	First Prize—Champion Certificate.			
101	Don Granter, 163 Martin-street, Gardenvale, S.4 (Brown Leghorn)	224	..	224
	Class 4.—Australorps—Wet Mash.			
	Equal First Prize—Champion Certificate; also Equal Burnley Champion Sash.			
152	Mrs. W. Savory, 170 Prospect Hill-road, Canterbury, E.7	286	..	286

The winning team of Australorps (1,522 eggs) owned by the "Belvedere" Poultry Farm (Mr. E. W. Lacy, Tasmania).

Section B.—Individual Birds—continued.

Pen No.	Name and Address.	Total Eggs.	Under-weight.	First Grade Eggs.
	Class 4.—continued.			
	EQUAL FIRST PRIZE—CHAMPION CERTIFICATE; ALSO EQUAL BURNLEY CHAMPION SASH.			
162	C. H. Harvey, Pakenham South	286	..	286
	THIRD PRIZE—GOVERNMENT CERTIFICATE.			
121	W. Drinkwater, 6 Kennedy-street, Fairfield Park, N.20	273	4	269
	Class 5.—Rhode Islands—Wet Mash.			
	FIRST PRIZE—CHAMPION CERTIFICATE.			
198	G. D. Lockhart, 11 Blair-street, Bentleigh, S.E.14 (Rhode Island Red)	252	..	252
	SECOND PRIZE—GOVERNMENT CERTIFICATE.			
202	W. Tedstone, Whitehorse-road, Balwyn, E.8 (Rhode Island Red)	254	7	247
	EQUAL THIRD PRIZE—GOVERNMENT CERTIFICATE.			
184	A. A. Cleve, Porter-road, Heidelberg West, N.23 (Rhode Island Red)	221	..	221
	EQUAL THIRD PRIZE—GOVERNMENT CERTIFICATE.			
188	Miss M. Dewar, Ferntree Gully-road, Notting Hill (Rhode Island Red)	221	..	221

SECTION A.—FOR THE GREATEST NUMBER OF FIRST GRADE EGGS LAID BY INDIVIDUAL BIRDS IN EACH CLASS OF SECTION A.

Pen No.	Name and Address.	Bird No.	Total Eggs.	Under-weight.	First Grade Eggs.
	Class 1.—White Leghorns—Wet Mash.				
	FIRST PRIZE—CHAMPION CERTIFICATE.				
17	M. G. Occleshaw, "Lauriston," Warrandyte-road, Ringwood	98	259	..	259
	SECOND PRIZE—GOVERNMENT CERTIFICATE.				
10	Stan Iddles, 33 Candy-street, Northcote, N.16.	55	256	4	252
	THIRD PRIZE—GOVERNMENT CERTIFICATE.				
25	P. C. Thomson, 142 Fyans-street, South Geelong	148	251	..	251
	Class 2.—White Leghorns—Dry Mash.				
	FIRST PRIZE—CHAMPION CERTIFICATE.				
32	Cranhaven Poultry Farm (Miss D. Lloyd), Box 10, Frankston	192	275	1	274

Section A.—First Grade Eggs by Individual Birds—continued.

Pen No.	Name and Address.	Bird No.	Total Eggs.	Under-weight.	First Grade Eggs.
	Class 2.—continued.				
	SECOND PRIZE—GOVERNMENT CERTIFICATE.				
31	"Caithness" (M. G. Skinner), 75 Vincent-street, Sandringham, S.8	181	267	..	267
	THIRD PRIZE—GOVERNMENT CERTIFICATE.				
43	"Wywurry" (L. Magnusson), Private Bag, Nathalia	258	257	1	256
	Class 3.—All Light Breeds other than White Leghorns—Wet Mash.				
	FIRST PRIZE—CHAMPION CERTIFICATE.				
30	Sorrento Farm, Campbell-road, Sorrento (Black Leghorn)	180	235	..	235
	SECOND PRIZE—GOVERNMENT CERTIFICATE.				
29	Don Granter, 163 Martin-street, Gardenvale, S.4 (Brown Leghorn)	169	214	5	209
	THIRD PRIZE—GOVERNMENT CERTIFICATE.				
29	Don Granter, 163 Martin-street, Gardenvale, S.4 (Brown Leghorn)	170	208	5	203
	Class 4.—Australorps—Wet Mash.				
	FIRST PRIZE—CHAMPION CERTIFICATE.				
57	F. W. Greenfield, Goodwin-street, Blackburn	341	284	1	283
	SECOND PRIZE—GOVERNMENT CERTIFICATE.				
57	F. W. Greenfield, Goodwin-street, Blackburn	342	279	..	279
	THIRD PRIZE—GOVERNMENT CERTIFICATE.				
56	T. L. Eastaugh, Pt. Nepean-road, Highett, S.21	336	278	..	278
	Class 5.—All Heavy Breeds other than Australorps and Rhode Islands—Wet Mash.				
	FIRST PRIZE—CHAMPION CERTIFICATE.				
44	"Australpar" (H. Shaw), 15 Mayfield-street, Ripponlea, S.2 (Partridge Australorp)	260	219	1	218
	Class 5.—Rhode Islands—Wet Mash.				
	FIRST PRIZE—CHAMPION CERTIFICATE.				
49	S. N. Lloyd, Box 10, Frankston (Rhode Island Red)	293	254	1	253
	SECOND PRIZE—GOVERNMENT CERTIFICATE.				
47	W. Donovan, 24 Regent-street, Brighton, S.6 (Rhode Island Red)	280	238	2	236

The Sorrento Poultry Farm's team of White Leghorns (1,272 eggs).

Section A.—First Grade eggs by Individual birds—continued.

Pen No.	Name and Address.	Bird No.	Total Eggs.	Under-weight.	First Grade Eggs.
	Class 5.—continued.				
	EQUAL THIRD PRIZE—GOVERNMENT CERTIFICATE.				
50	J. Rankin, 14 Freeman-street, Balwyn, E.8 (Rhode Island Red)	297	234	..	234
	EQUAL THIRD PRIZE—GOVERNMENT CERTIFICATE.				
46	Cranhaven Poultry Farm (Miss D. E. Lloyd), Box 10, Frankston (Rhode Island Red)	273	243	9	234

SECTION A.—FIRST CLASS CERTIFICATES OF MERIT TO TEAMS IN CLASSES 1, 2, AND 4, WHICH LAID 1,200 FIRST GRADE EGGS, AND IN CLASSES 3 AND 5, WHICH LAID 1,000 FIRST GRADE EGGS.

Pen No.	Name and Address.	First Grade Eggs.
	Class 1.—White Leghorns—Wet Mash.	
23	J. A. Stewart, Maldon-road, Castlemaine	1,252
26	Wm. Vercoe, Bayswater	1,213
21	Sorrento Farm, Campbell-road, Sorrento	1,208
28	"Wywurry" (L. Magnusson), Private Bag, Nathalia	1,200
	Class 4.—Australorps—Wet Mash.	
66	"Renwil" (W. B. Torrens), 171 Cape-street, Heidelberg, N.22	1,255
58	H. J. Hulme, Milawa, via Wangaratta ..	1,243
67	Sandhills Poultry Farm (J. J. Kay), Scots-burn-avenue, Clarinda P.O.	1,238
68	W. A. Shevill, 35 Bourke-street, Mentone, S.11	1,220

FIRST CLASS CERTIFICATES OF MERIT TO INDIVIDUAL BIRDS IN CLASSES 1, 2, AND 4, WHICH LAID 220 FIRST GRADE EGGS, AND IN CLASSES 3 AND 5, WHICH LAID 200 FIRST GRADE EGGS.

Pen No.	Name and Address.	Bird No.	First Grade Eggs.
	Class 1.—White Leghorns—Wet Mash.		
20	"Ruburina" (V. D. Wallington), Nell-street, Greensborough	115	243
20	" " " "	117	250
20	" " " "	119	240
25	P. C. Thomson, 142 Fyans-street, South Geelong	146	237
25	" " " "	149	240
24	J. M. Sutherland, Fulton-road, Box Hill	140	245
24	" " " "	142	225
24	" " " "	144	244
26	Wm. Vercoe, Bayswater	155	232
26	" " "	156	230
21	Sorrento Farm, Campbell-road, Sorrento	122	222
28	"Wywurry" (L. Magnusson), Private Bag, Nathalia	168	242
16	Northeast and Son, 40 Elster-avenue, Gardenvale, S.4	94	220
16	" " " "	95	239
7	C. R. Fagg, 76 Maud-street, Geelong	38	233
7	" " " "	42	226
13	Mrs. O. M. Lett, 13 Coronation-street, Brighton, S.6	73	233
11	H. I. Jolly, Ace Poultry Farm, Trafalgar	64	245
11	" " " "	66	229
27	J. H. Wernli, Alpina Stud Poultry Farm, Cheltenham, S. 22	158	245
27	" " " "	161	250
17	M. G. Occleshaw, "Lauriston," Warrandyte-road, Ringwood	102	221
12	H. S. Kurban, 551 High-street, Northcote, N.16	72	231
6	T. L. Eastaugh, Pt. Nepean-road, Highett, S.21	32	246

First Class Certificates to Individual Birds for First Grade Eggs—continued.

Pen No.	Name and Address.	Bird No.	First Grade Eggs.
	Class 1.—continued.		
8	Golden Privet Poultry Farm (F. R. Marsh), Hamstead-road, Maribyrnong, W. 3	44	227
		46	243
18	T. A. Pettigrove, 159 Hawdon-street, Heidelberg, N.22	104	231
19	D. Raitt, Strathallan Poultry Farm, Highett-road, Highett, S.22	109	231
22	Owen Williams, Middleboro-road, Box Hill, E.11	132	224
9	F. Hansen, Heatherton-road, Springvale	50	250
9	,, ,, ,, ,,	54	238
1	Alf. Anstis, Springvale-road, Springvale	3	226
2	H. G. Bretherton, 224 Rossmoyne-street, Thornbury, N.17	9	228
5	W. Cullen, Werribee Poultry Farm, Werribee	25	224
14	S. N. Lloyd, Box 10, Frankston ..	84	234
	Class 2.—White Leghorns—Dry Mash.		
39	Sorrento Farm, Campbell-road, Sorrento	230	235
39	,, ,, ,, ,,	231	238
39	,, ,, ,, ,,	232	238
39	,, ,, ,, ,,	234	224
38	"Ruburina" (V. D. Wallington), Nell-street, Greensborough	223	222
38	,, ,, ,, ,,	225	240
38	,, ,, ,, ,,	226	220
43	"Wywurry" (L. Magnusson), Private Bag, Nathalia	254	233
43	,, ,, ,, ,,	257	231
32	Cranhaven Poultry Farm (Miss D. E. Lloyd), Box 10, Frankston	188	225
36	Lockside Poultry Farm (R. H. Chaffey), Box 18, Mildura	216	220
37	A. and W. Millington, "Fenton," Murray-street, Fawkner, N.15	217	230
42	J. M. Sutherland, Fulton-road, Box Hill	248	224
35	A. J. Hill, Sunraysia Poultry Farm, Greensborough	208	242
34	D. Granter, 163 Martin-street, Gardenvale, S.4	200	238
	Class 4.—Australorps—Wet Mash.		
70	Belvedere Poultry Farm (E. W. Lacy), Fern Tree, via Hobart, Tasmania	415	242
70	,, ,, ,, ,,	416	240
70	,, ,, ,, ,,	417	242
70	,, ,, ,, ,,	418	265
70	,, ,, ,, ,,	419	273
70	,, ,, ,, ,,	420	259
56	T. L. Eastaugh, Pt. Nepean-road, Highett, S.21	332	249
56	,, ,, ,, ,,	333	231
56	,, ,, ,, ,,	335	224
57	F. W. Greenfield, Goodwin-street, Blackburn	338	230

First Class Certificates to Individual Birds for First Grade Eggs—continued.

Pen No.	Name and Address.	Bird No.	First Grade Eggs.
	Class 4.—continued.		
66	"Renwil" (W. B. Torrens), 171 Cape-street, Heidelberg, N.22	395	245
58	H. J. Hulme, Milawa, via Wangaratta	343	261
58	,, ,, ,, ,,	347	236
58	,, ,, ,, ,,	348	227
67	Sandhills Poultry Farm (J. J. Kay), Scotsburn-avenue, Clarinda, P.O.	397	236
67	,, ,, ,, ,,	398	224
67	,, ,, ,, ,,	401	220
68	W. A. Shevill, 35 Bourke-street, Mentone, S.11	403	241
52	J. Anderson, Kismet, Castlemaine	308	232
52	,, ,, ,, ,,	311	245
55	W. Cullen, Werribee Poultry Farm, Werribee	325	247
61	Mrs. S. A. Kelly, "Shipley," Pascoe Vale-road, Pascoe Vale, W.8	361	247
61	,, ,, ,, ,,	363	241
61	,, ,, ,, ,,	365	248
63	Mrs. D. Mason, Mount Evelyn-road, Lilydale	374	249
63	,, ,, ,, ,,	377	252
64	Mason and Taylor, 15 Landcox-street, North Brighton	382	245
54	T. J. Crewther, Carlow-street, East Bentleigh, S.E.15	322	221
69	"The Red Line" (G. R. Greenlees), Yan Yean	410	249
	Class 5.—Rhode Island Reds—Wet Mash.		
50	J. Rankin, 14 Freeman-street, Balwyn, E.8	299	213
50	,, ,, ,, ,,	300	207
51	W. Tedstone, Whitehorse-road, Balwyn, E.8	301	233
49	S. N. Lloyd, Box 10, Frankston ..	292	217
45	D. Blyth, Senior, 32 Steele-street, Moonee Ponds, W.4	268	202
46	Cranhaven Poultry Farm (Miss D. E. Lloyd), Box 10, Frankston	276	215
48	P. Fawcett, Bradley-street, Newport, W.15	286	212

SECTION B.—FIRST CLASS CERTIFICATES OF MERIT TO HENS IN CLASSES 1, 2, AND 4, WHICH LAID 240 FIRST GRADE EGGS, AND IN CLASSES 3 AND 5, WHICH LAID 220 FIRST GRADE EGGS.

Pen No.	Name and Address.	First Grade Eggs.
	Class 1.—White Leghorns—Wet Mash.	
78	A. Siede and Son, Highett Poultry Farm, Pt. Nepean-road, Highett, S.21	268
51	A. May (W. J. May), Hewlett-road, Tally Ho	265
63	C. Perkin, 53 Argyle-street, St. Kilda, S.2	257

Section B.—Certificates of Merit for First Grade Eggs—continued.

Pen No.	Name and Address.	First Grade Eggs.
	Class 1.—White Leghorns—Wet Mash.	
19	T. L. Eastaugh, Pt. Nepean-road, Highett, S.21	256
53	Medway Poultry Farm (S. A. Armstrong), Springvale-road, Springvale	256
93	A. and R. McKinley, "Sandhurst," Carrum Downs	256
94	" " " " "	256
5	W. A. Bradshaw, Lily-street, Geelong West	253
13	J. E. Cox, 72 Clarendon-street, Northcote, N.17	253
27	Stan Iddles, 33 Candy-street, Northcote, N.16	251
62	O. Pearse, "Etker," Box 33, Donald ..	250
45	K. McKenzie, 82 Clarence-street, Geelong West	250
79	Sorrento Farm, Campbell-road, Sorrento	250
73	Sandhills Poultry Farm (J. J. Kay), Scotsburn-avenue, Clarinda P.O.	249
11	J. Chatts, 319 Jasper-road, Ormond, S.E.14	246
48	C. and D. McLauchlan, 144 Through-road, Burwood, E.13	245
86	T. A. Welch, Hayes-road, North Essendon	244
43	G. McDonnell, 46 Childers-street, Kew, E.4	242
31	Mrs. G. M. Jones, 36 Johnston-street, Newport, W.15	241
	Class 2.—White Leghorns—Dry Mash.	
217	H. I. Jolly, Ace Poultry Farm, Trafalgar	251
216	A. R. Davey, 84 Victoria-road, Dennis, N.16	242
209	J. H. Rogers, Seaford	240
	Class 4.—Australorps—Wet Mash.	
145	C. Perkin, 53 Argyle-street, St. Kilda, S.2	268
107	R. R. Christie and Son, "St. Elmo," Tucker-road, Bentleigh, S.E.14	267
147	Mrs. H. N. Read, Wonga Park, via Heidelberg	267
150	Sandhills Poultry Farm (J. J. Kay), Scotsburn-avenue, Clarinda P.O.	264
131	H. R. McChesney, Hereford-road, Mount Evelyn	263
116	H. R. Cropley, Boronia-road, Bayswater	258
122	W. Drinkwater, 6 Kennedy-street, Fairfield Park, N.20.	255
142	J. A. Naylor, 858 Heidelberg-road, Alphington, N.20.	253
166	A. and R. McKinley, "Sandhurst," Carrum Downs	251
118	W. Cullen, Werribee Poultry Farm, Werribee	250
159	L. A. Young, 37 Barcelona-street, Box Hill, E.11	246
158	W. Wekwerth, 35 Maling-road, Canterbury, E.7	246
149	Sandhills Poultry Farm (J. J. Kay), Scotsburn-avenue, Clarinda P.O.	240

DUCKS.

The competition, which concluded on the 2nd March last, was the ninth competition for ducks conducted at Burnley. There were 22 entries. The number of eggs laid was very satisfactory; the six leading ducks each laying over 300 first grade eggs in the 336 days of the test.

Mr. H. Lloyd's Khaki Campbell duck which laid 326 eggs.

PRIZE LIST—DUCKS.

BURNLEY DUCK EGG-LAYING COMPETITION, 1936-37—SINGLE TEST.

Pen No.	Name and Address.	Total Eggs.	Underweight.	First Grade Eggs.
	First Prize, Champion Certificate; also Burnley Champion Sash.			
8	H. H. Lloyd, Eulalie Poultry Farm, Frankston (Khaki Campbell)	326	..	326
	Second Prize—Government Certificate; also Second Prize—Burnley Sash.			
10	H. H. Lloyd, Eulalie Poultry Farm, Frankston (Khaki Campbell)	321	..	321
	Equal Third Prize—Government Certificate.			
5	Braeside Duck Farm (T. Milner), 45 Austin-crescent, Pascoe Vale, W.8 (Khaki Campbell)	306	..	306
13	Braeside Duck Farm (white Indian Runner.)	306	..	306

In the final results, first and second prizes were won by Khaki Campbell ducks, both of which were owned by Mr. H. H. Lloyd; they laid 326 and 321 first-grade eggs respectively, a very fine performance. The six Khaki Campbell ducks entered by Mr. Lloyd laid the remarkably good total of 1,753 first-grade eggs, an average of 292·2 eggs per bird. The Braeside Duck Farm (Mr. T. Milner) secured equal third prizes with Khaki Campbell and White Indian Runner ducks, which put up another fine performance, each duck having laid 306 first-grade eggs.

Although not included amongst the prize winners, six Buff Orpington ducks owned by Messrs. C. and D. McLauchlan put up a wonderful performance for this breed by laying 1,726 first-grade eggs; one of these ducks laid 301 first-grade eggs. Another good performance was that of a Fawn and White Indian Runner duck owned by Mr. R. J. A. Milner. This bird laid 287 first-grade eggs, the highest number for the breed in the competition.

All the above breeders have been most successful in winning prizes in previous Burnley Duck Egg-laying Competitions.

The number of ducks in the competition at the beginning was 22; one of these died during the test. The total number of eggs laid, including those underweight, was 6,119, an average per bird of 278·1 for the 48 weeks. The price realized for eggs averaged a fraction over 11½d. per dozen. The market value of eggs was 22s. 2½d. per bird and the cost of food averaged 12s. 10d. per bird, or a fraction under 3¼d. per week. Thus the profit over cost of food for the 48 weeks averaged 9s. 2½d.

Hereunder is given a list of the different kinds and quantities of the foods fed to the ducks during the currency of the competition:—Wheat pollard, 2,659 lb.; bran, 1,638 lb.; Meat, 176 lb.; salt, 5 lb.; grit, 154 lb.

Butter Production and Export

The following table shows:—

(*a*) Factory production of butter and cheese in Victoria for the period July, 1936, to January, 1937, compared with the corresponding period of 1935–36; and

(*b*) Quantities and percentages of various grades of bulk butter examined for export in Victoria from 1st July, 1936, to 27th February, 1937, in comparison with the corresponding period of 1935–36.

FACTORY PRODUCTION OF BUTTER AND CHEESE IN VICTORIA (QUANTITIES IN TONS).

Month.	Butter.		Cheese.	
	1936–37.	1935–36.	1936–37.	1935–36.
July to September	12,713	13,563	1,140	1,156
October	8,635*	9,309	747*	689
November	9,142†	10,136	818*	681
December	8,840†	8,476	711†	579
January	7,918†	6,670	631†	483
Totals, 7 months	47,248	48,154	4,047	3,588

* Revised. † Subject to revision.

BULK BUTTER EXAMINED FOR EXPORT IN VICTORIA (QUANTITIES IN TONS).

Period.	1936–37. How Graded—				Total.	Period—	1935–36. How Graded—				Total.
	Ch.	1st.	2nd.	Pty.			Ch.	1st.	2nd.	Pty.	
1st July to 30th January ..	21,715	6,749	1,854	267	30,585	1st July to 1st February ..	20,229	9,834	2,195	293	32,551
1st to 27th February ..	2,754	979	291	57	4,081	2nd to 29th February ..	1,396	1,038	323	65	2,822
Totals 1st July to 27th February ..	24,469	7,728	2,145	324	34,666	Totals 1st July to 29th February ..	21,625	10,872	2,518	358	35,373
Percentages ..	70·6	22·3	6·2	0·9	..	Percentages ..	61·1	30·8	7·1	1·0	..

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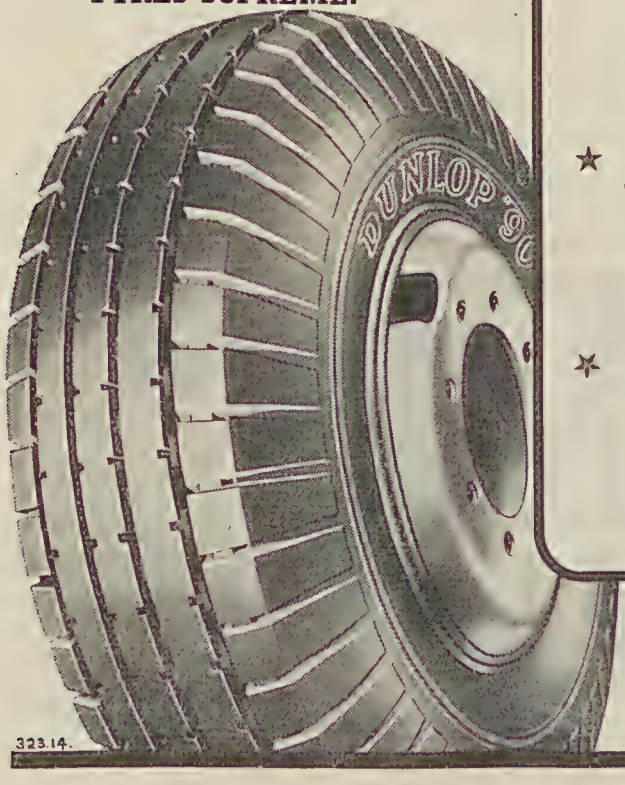

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A pastoral scene in the Central district.

Pasture Improvement Work

Results of 1936 Tests

Fifth Annual Report of the Experimental Pasture Work conducted by the Department of Agriculture under arrangement with the Victorian Pasture Improvement League.

By R. L. Twentyman, B.Agr.Sc., Agrostologist

THE experimental work conducted by the Department of Agriculture for the Victorian Pasture Improvement League was commenced in 1932 and this fifth report is mainly confined to the results of the experiments measured or observed during 1936. A full record of the work in the earlier years is to be found in the annual reports issued and published early in 1933–4–5 and 6.

The bulk of the experimental work still consists of manurial and sown species trials situated on the original sites as laid down in 1932. Following encouraging results which had been obtained on some of the major plots in Gippsland and the Western District, additional trials, consisting of mowing manurial plots, have been laid down in the vicinity of the responsive plots to determine the general applicability of these results to the districts as a whole.

Extensions to the original plan of work have been undertaken in the lighter pastoral areas of the Western District where trials with subterranean clover on native pasture land, and with introduced grass species on established subterranean clover pastures, were commenced in 1935. The original plots were laid down on a standard plan either as Major or Pilot plots but in the more recently established trials the lay-out has been varied largely according to the nature of the problem to be investigated, and with the benefit of experience gained in handling the earlier plots.

During the past year the usual manurial dressings were given to the mowing sections of the major plots, but the applications to the grazing plots, the sown species areas and to the pilot plots were withheld. Responses on these latter areas, therefore, have been due to the residual effects of previous manurial applications.

Major Plots.

The manurial trial mowing areas have continued to furnish good results, but the records from the rotational grazing plots have not been any better than in previous years, and they have not given a satisfactory indication of the actual differences in pasture growth on these variously manured areas. However, these grazing plots have provided a valuable comparison with the sward growth on the mowing manurial trials, and have proved more useful for studying the effect of the manurial treatment on the botanical composition of the manured areas rather than for measuring the resultant increase in growth. In the absence of the usual top-dressing the productivity on these manured grazing areas declined materially during the past year especially on the plots which had previously shown a good response to superphosphate.

The potash treatment was applied again to the cross strips on the grazing areas in the past year and where potash responses were being obtained the improved growth on these strips across the grazing areas has become more conspicuous each year. On some of the trials the mowing manurial plots are showing the effect of the repeated cutting and removal of the produce in the depletion of the general soil fertility, and apparently as a direct consequence of this, the response to potash on these plots has become increasingly marked.

The sown pasture mixture and strain sections have passed the establishment period and have reached a stage when the persistency of the various species under permanent pasture conditions is being revealed.

Pilot Plots.

The pilot plots, which include a manurial trial on typical local pasture and a species trial on adjacent land that has been ploughed, cultivated and sown to the various grass and clover species, have been used solely for observational purposes. Such plots are limited in value by the fact that manurial differences of considerable magnitude only, can be detected by observation, and the irregular grazing necessarily given to these areas differentially influences the survival of the various species.

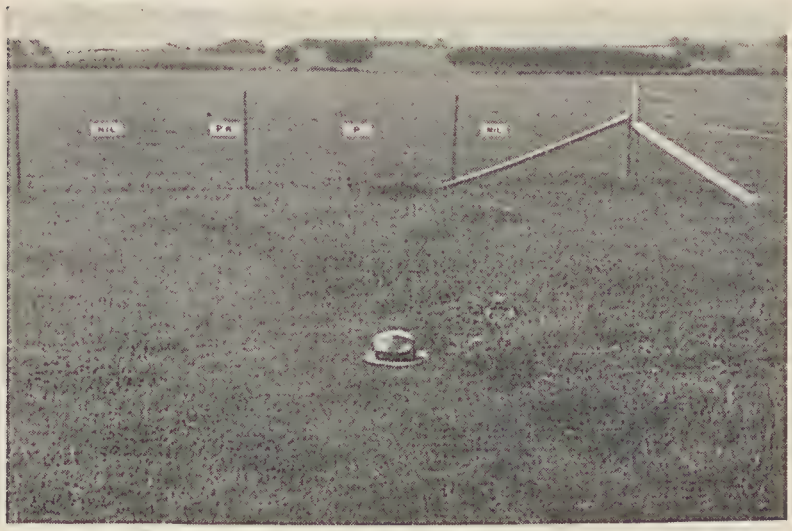
These plots have been useful in detecting outstanding manurial responses and species adaptability but they are not suitable for recording cumulative effects which develop as a result of increased growth, stocking, and the return of animal droppings. Furthermore on these plots the survival of species is considerably influenced by relative palatability. The pilot plots were originally established to determine if there were any outstanding manurial treatments or pasture species likely to warrant more detailed study in the various districts. Almost invariably it has been found that there has been a marked prolonged response to superphosphate and the responses to other fertilizers on these pilot plots have usually been comparatively small.

New Manurial Trials—Lime and Potash Investigations.

During the first three years of the earlier trials, unexpected results of particular interest were obtained from lime at Warragul and Mirboo North, and from potash on the major plots in the Colac and Cobden districts. At the time the Cobden experiments were commenced, it had been stated that the pasture there did not seem to be giving the vigorous response to top-dressing with superphosphate that had been obtained in earlier years. From the beginning of the trials, the Cobden and Colac (Larpent) major plots showed some response to potash and, as a result of the continued mowing and removal of the produce from the area, the potash responses have become the most conspicuous feature of these tests.

In order to determine if these results would apply to pastures in the surrounding districts, an extension of the plots in these responsive areas was made. Six new mowing trials were laid down to investigate the lime responses in the Gippsland red hill country. In the Cobden and Colac districts six new complete mowing trials and ten observational trials were established to determine if potash would be of general value. The yields obtained from these new plots are shown in Tables XIX. and XXVI. While the Gippsland lime trials do not all show such large increases as those obtained earlier, the potash responses of the Western District areas are just as marked as were the earlier results of the major plots.

During the fourth year of the tests (1935), the results indicated that the potash deficiency was not confined to the soils of the Cobden and Colac areas, but might assume importance on most of the poorer soils in the Western District. Consequently, arrangements were made to conduct a preliminary soil survey of the area to determine if any relationship existed between the characteristics of the soils and their responses to potash fertilizer. Previously, in 1933, soil samples had been taken from each of the major and pilot plots and the total soil potash in each had been ascertained by chemical analysis. It was found that the figures for total potash were not in satisfactory



Showing marked increase in growth due to manurial treatment on one of the new mowing plots—Colac West.

agreement with the recorded field responses, nor were the values shown for soil reaction (pH) or for extractable lime a satisfactory indication of soil response to lime treatment.

In this recent soil survey, improved methods for relating soil conditions under pasture with field response to potash and lime have been adopted. It has been found that replaceable potash, as determined by the Hissink procedure, provides a satisfactory index to soil potash status, while the degree of unsaturation of the replaceable base complex is related in a useful manner with the response to lime. This work has been undertaken by the Agricultural Research Chemist and the results of the investigations upon soil samples taken from the responsive and unresponsive plots will be the subject of a report to be published later.

Weather Conditions during 1936.

Very dry weather prevailed during the first half of the year, and in most districts the autumn and winter growth of pastures was exceptionally poor. Good rains fell in the late winter in Gippsland and the Western District and growth commenced very early in the spring but was later checked by a dry period. In the Central District the dry conditions continued well into the spring and, together with unusually late frosts, checked pasture growth. Fortunately late in the season good rains occurred and with an absence of hot weather enabled perennial pastures to make exceptionally late growth which was prolonged well into the summer period.

The unusually dry autumn and winter of 1936 resulted in the standing dry feed in the paddocks being kept in excellent condition and even well into the winter it maintained good feeding value. Conditions this year are very different and the prolonged summer rains have not only damaged large quantities of grass hay but also have spoilt the feeding value of much of the standing dry feed. Fodder reserves were severely depleted last winter and a good crop of grass hay in the past season would have been most useful in replenishing reserves.

Largely as a result of the dry season the mowing plots required a lesser number of cuts than usual to keep them in order, and the first cut for the season, on most plots, was not made until well into the winter and even then the yields were light.

GENERAL SUMMARY OF 1936 RESULTS.

(Non-Irrigated Pastures.)

Manurial Trials.

The results obtained during the past season have confirmed those obtained in the previous year. Although they are generally similar to those of the earlier years, the recent results indicate that, at least over a considerable area of Victorian pasture land, there is a limit to the ability of the usual methods of artificial manuring in improving pasture growth.

Until recently it was considered that Victorian soils had a sufficient supply of available potash to meet pasture requirements, but these experiments indicate that, stimulated by repeated dressings of water soluble phosphate, the soil potash supply may be rapidly exhausted. Potash responses, though most marked on the mowing manurial trials, are not solely confined to them and during the past season striking results have been observed on grazing plots and adjoining farm paddocks.

It would be expected that under a system of regular mowing and removal of the produce that a depletion of the potash supply in the soil might be brought about eventually, but in the plots

recently established at Cobden marked responses to potash fertilizer were obtained from the outset without any previous period of mowing which could be held responsible for the deficiency.

The potash responsive plots have been confined mainly to the basaltic soils, but, as practically all of the Western District consists of a large volcanic plain, most of the plots in this district are on soils derived from basalt. At Larpent and Cudgee, the soils are largely composed of wind-blown material overlying the basalt and, agriculturally, these soils bear little resemblance to the soil at Cobden. This latter soil is similar to those on the greater bulk of the western plains, which are usually shallow leached soils developed *in situ* from the underlying basalt rock.

Typical formation in the potash responsive areas of the Western District, showing soil directly overlying the basalt rock.

The natural pasture on these soils usually consists of an open sward of Danthonia sp. and flatweed with a variety of small weeds and has a carrying capacity of about one sheep per acre. Improved by top-dressing and the introduction of subterranean clover, the carrying capacity of this land may be increased two or three-fold, and even greater in the wetter districts, where perennial rye-grass may be established. At Kyneton and Warragul, some good potash responses have also been recorded and these have been on basalt soils, but improvement has also been obtained at Korumburra and Toora on soils derived from Jurassic mudstone. On both these latter plots, the potash has been more than able to compensate for the depressing effect of the sulphate of ammonia also applied and the potash treated plots have yielded rather better than those receiving super only.

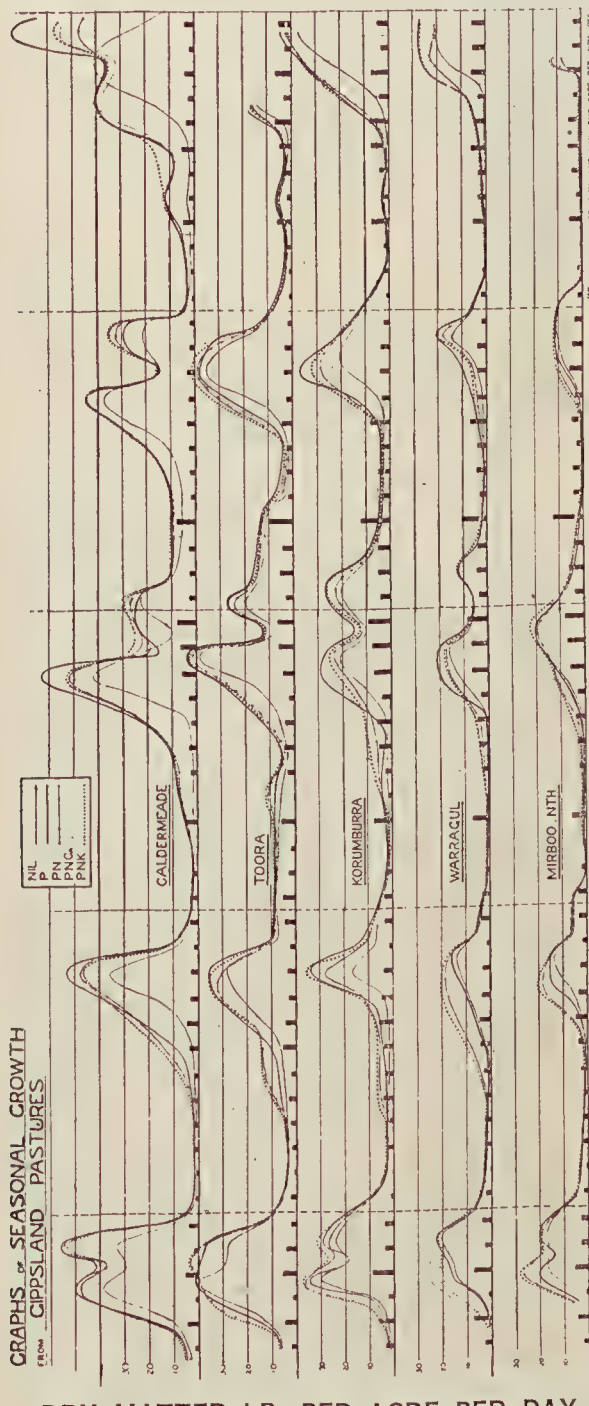
A "close up" view of the soil face in the above illustration showing bleached surface soil, buckshot gravel layer and, below, the decomposing rock.

Agriculturally the main common feature possessed by these potash responsive soils is that they generally appear to be in "poor heart". Their previous history usually reveals that at some period they have been exhaustively cropped and now do not respond satisfactorily to dressings of superphosphate alone. At the present time the extent of the potash exhaustion on these pasture soils is not known, but, if it is restricted mainly to the surface soil, it is possible that as soon as the heavy demand on the soil is removed, the pasture may quickly recover.

Superphosphate.

The excellent response to superphosphate was the most

conspicuous feature of the manurial trials in the earlier years and, while it still continues to give good increases, the spectacular results from it have been sustained only where dressings of potash have been given in addition. On almost every plot superphosphate has shown an increase in growth but usually the greatest responses have been obtained on the sandy soils and light loams. On the very rich volcanic soils such as at Noorat, Coragulac, and Stoneyford the response has been small. The cocksfoot-red clover pastures on the Gippsland red hill country have given only a poor response to super. alone but where lime and nitrogen were given in addition the increased growth was substantial. More recently on this country there has been a somewhat better response from super. alone than was obtained in the early years and it is probable that the cumulative effect of the four annual dressings is now showing up.



The effect of various manurial treatments on some Gippsland pastures.

Graphs showing the effect of various manurial treatments on Gippsland and Western District major plot pastures during the period, July, 1932, to February, 1937. The manurial dressings indicated in the legend are as follow:—Nil = No Manure; P = superphosphate 2 cwt. p.a.; PN. = super. 2 cwt. + sulphate of ammonia 1 cwt. p.a.; PNCa = super. 2 cwt. + S. of A. 1 cwt. + lime 1 ton p.a. (1932 only); PNK = super. 2 cwt. + S. of A. 1 cwt. + potash 1 cwt. p.a.

The small black vertical columns indicate the monthly rainfall in inches.

Note the poor growth at Warragul and Mirboo North.

Under the system of regular mowing the response to super. has been mainly confined to the early spring. Supered plots have usually shown a better recovery after the autumn break and have given improved winter growth but the greatest effect is shown in the stimulus given to growth in the early spring which later results in a large increased bulk of spring growth. On the mowing plots, however, the increased growth is no longer appreciable after mid-spring and by late spring the yield on the supered plots is very little better than that on the unmanured strips.

The general dressing of superphosphate given to these plots has been 2 cwt. per acre applied in the autumn, but 3 cwt. dressings have been given for comparison, and here the extra 1 cwt. has been applied in the early spring. Usually the heavier

dressings have shown very little improvement over the 2 cwt. treatment and it seems unlikely that, on non-irrigated Victorian pastures, there is anything to be gained by increasing the amount of super. given above 2 cwt. per acre per annum.

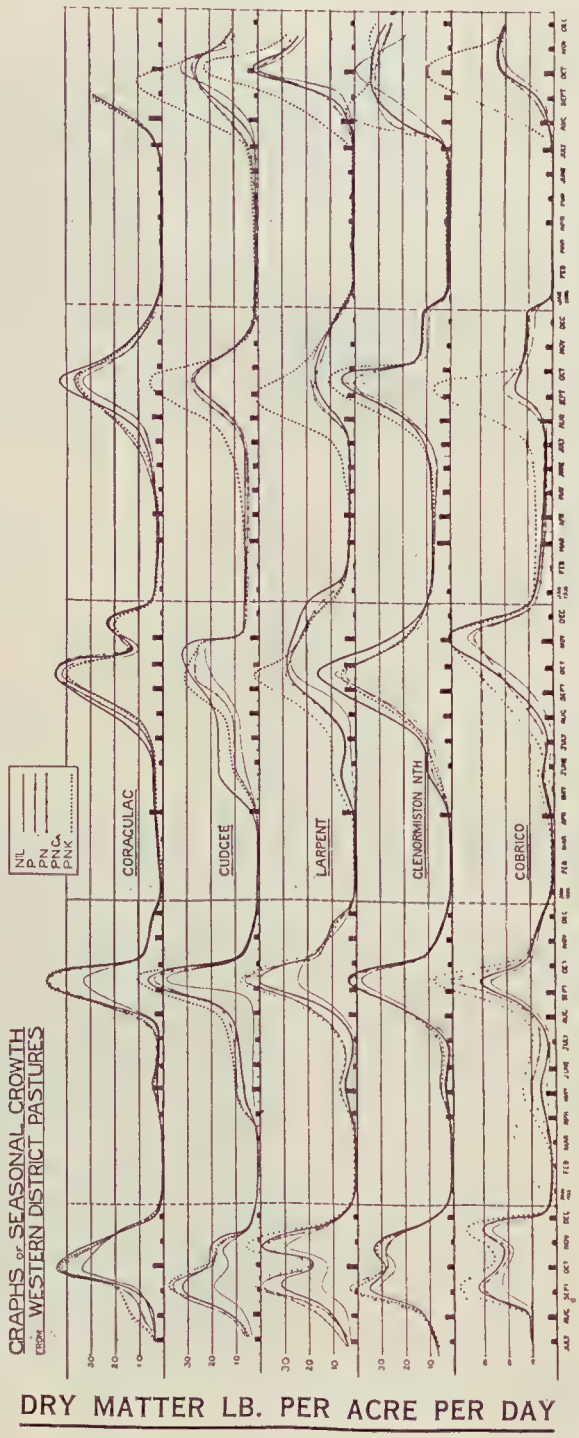
Potash.

According to plot location very variable results have been obtained from dressings of potash. Applied alone it has seldom shown any response but, where the applications have been given together with superphosphate, it has occasionally given very good results. On most of the plots it has not shown any response as yet but, quite frequently where pasture growth is not good and where dressings of super. alone fail to effect any material improvement, an additional dressing of potash has immediately encouraged a good response.

The increased growth has been so great on several of the plots that it is difficult to understand why potash has not become of more general use on the farms in responsive districts. The high cost of the fertilizer and the fact that the pastures have seldom shown any marked response to the first dressing may account for this manure being neglected for pasture purposes. Farmers generally are aware of the rapid stimulus to pasture growth which results from the use of either phosphates or nitrogenous fertilizers and naturally a more expensive fertilizer would be expected to show as good or better immediate response.

In the first three years potash gave promising results at Larpent and Cobden, while in the fourth year, the winter and spring responses were so good that it was thought that they might have been accentuated by abnormal seasonal conditions. During the past year, under very different weather conditions, however, the responses on a number of plots have been equally large and there is every reason to believe that they will be repeated in subsequent years.

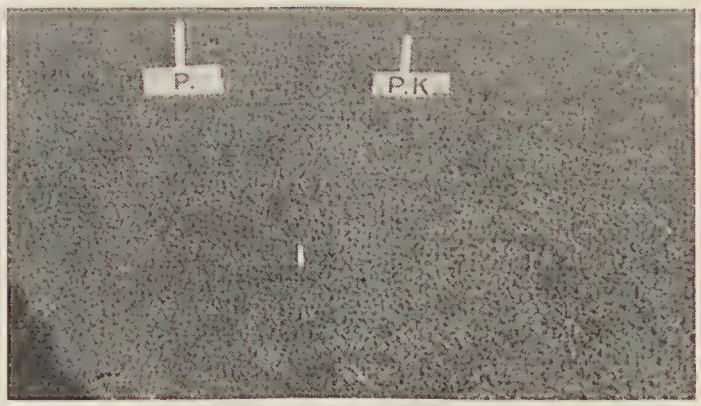
The responses to potash have been most marked where poor soils have been encouraged to make abnormally strong growth by continued applications of super. Generally such soils have made a good response to super. for some years but eventually it has become smaller and in some instances heavier dressings have been resorted to without any improvement in the condition of the pasture.



The effect of various manurial treatments on some Western District pastures.

For legend &c. see page 177. Note the progressive increase due to the potash treatment on most of these plots.

The results obtained from the plots at Cudgee during the years 1932-36 (see Table XII.), show this effect quite clearly and it will be seen that in the first year, though there was an excellent response to superphosphate, plots receiving potash in addition did not show any further improvement. More recently this response to superphosphate only has declined and at present is quite small, while the plots receiving potash in addition have maintained their vigour and still show a large increase in yield.



Showing increased clover growth on potash treated plot (right).

The potash responses on the mowing plots have usually been most conspicuous in the early spring but, with this fertilizer, the improved growth has been continued for a longer period than would occur where responses to superphosphate or sulphate of ammonia are obtained.

Results obtained on the small grazing plots at Ellinbank, near Warragul, indicate that the growth of the pasture may influence the apparent response to potash. On these trials a number of variously manured small plots had been established side by side and a strip across them was treated with potash. During the past season, the vigour of pasture growth on these plots varied greatly, according to the particular manurial treatment they had received, and it was obvious that though the potash-treated strips showed up clearly on the strongly growing plots, on the poorer plots, where the pasture growth was much weaker, there was no evidence of any response at all. Apparently this soil contains sufficient potash to meet normal growth requirements but, where the pasture has been encouraged to make heavier growth, the available soil potash is not sufficient for requirements.

On most of the plots where the potash deficiency has become acute, the effect on the sward has been shown in the absence of clovers and a loss of vigour of the better grasses. Flat weed, plantain, sweet vernal, Yorkshire fog and stunted *Festuca bromoides* are the usual species present on these swards, and they are all unthrifty and make poor winter growth. Since the rotational grazing plots were established at Larpent in 1932, there has been a deterioration in the swards, particularly where they have received both superphosphate and sulphate of ammonia. Here the clover has been reduced and the rye-grass, losing vigour, has largely been replaced by *Festuca bromoides*. This deterioration of the sward, however, has not occurred where potash has been applied on the cross strips. Here the sward still consists of vigorous rye-grass and subterranean clover, and it shows a marked contrast with the adjacent sections not receiving potash.

Sulphate of Ammonia.

Winter growth on Victorian pastures frequently is checked by the lack of soil nitrogen but, where clover is abundant in the sward, there usually is a plentiful supply, winter growth is good and there is not much necessity for the use of nitrogenous fertilizers. Where, however, the pasture is mainly composed of grass species the soil nitrogen supply is liable to be low, particularly on old permanent pastures, and here marked responses to nitrogenous fertilizers can be expected.

When this programme of experimental work was commenced it was decided that dressings of sulphate of ammonia should be given both in the autumn and early spring. It was expected that dressings given at these times would enable better growth to be made in the winter and early spring and so help to shorten the lean winter period. The first spring dressings gave a marked stimulus to pasture growth, but subsequent autumn and spring dressings applied to the same plots gave lesser increases, and it was apparent that they were leaving the sward in an exhausted condition. The clovers were reduced, the annual grasses increased, and the swards on these areas generally deteriorated and they repeatedly gave lower yields than the adjacent plots, which had received a dressing of super. only without the additional nitrogenous fertilizer.

It was found that autumn applications of nitrogen could not be depended upon to give any increase in yield and as they exerted the usual injurious effect on the sward it was decided to omit the autumn dressing and give one application

in the early spring only. Even this treatment failed to prevent injury to the sward and during the past season the spring nitrogen application was barely able to overcome the exhaustive effect of the previous dressings. Pastures require large amounts of nitrogen to maintain vigorous growth and, as this usually is obtained through the clovers, any treatment which checks the clover growth will ultimately check the vigour of the sward even although the manurial treatment might give a temporary stimulus.

Much more encouraging results have been obtained at Nalangil where, on a heavy black clay soil with an almost pure rye-grass sward, large responses to nitrogenous fertilizers have been obtained without the sward appearing to suffer any subsequent period of depression. Under similar conditions nitrogen may prove valuable in encouraging an early recovery after the winter which may develop into a dense heavy growth before it is checked by hot weather late in the spring.

Lime.

In the first year fine calcium carbonate was applied at the rate of 1 ton per acre to the lime-treated strips in each plot. Though on most of the plots there has been no response to this dressing, at Warragul and Mirboo North marked increases in growth were obtained where the lime was applied in addition to super. and sulphate of ammonia.

Since these trials were begun, lime in various forms has been used in experimental plots and it has been concluded that, for pasture purposes, the response to lime is independent of the actual form of lime applied (providing it is of reasonably fine texture).

Probably the most striking responses to lime that have been seen on pasture in southern Victoria have been produced on the Departmental plots at Kilmore, but even here so uncertain are the results from this material that although one side of a small five-acre experimental field has given a good response there is no appreciable response at all on the other side of the same field.

The usual chemical tests, for soil reaction and total lime content, made on the soil samples obtained from the various plots have not been of much value in forecasting the probable pasture response to lime treatment. While most Victorian pasture soils are definitely acidic in character they usually do not show any response to liming and many of the best pastures are growing on such acid soils. More recently a method which has been developed by the Agricultural Research Chemist has given promising results in relating soil characteristics with response to lime treatment.

It is apparent that some Victorian soils will give a good response to lime when used in conjunction with superphosphate. But, in view of the heavy applications required and the comparatively high cost of such treatment, it is advisable, even where response might be expected, to determine its effect on a small area, before proceeding to apply lime on a large scale.

Ground Rock Phosphate.

Ground rock phosphate was included in the Gippsland trials only and although much slower in its action than superphosphate it usually has exerted a prolonged beneficial effect. Previous experience with this material in Victoria was mainly derived from wheat manurial trials for which purpose it usually was little better than "no manure."

Applied as a top-dressing to pasture land its effect in the first year was small but the ultimate effect has been good, and on plots which have not been treated for some years it is still showing a substantial improvement.

Blood and Bone.

When first applied an improved grass growth was obtained from the nitrogen contained in blood and bone, but later these plots were more backward than those receiving superphosphate only. More recently these plots have improved in growth and still show a considerable benefit from the treatment.

Pasture Mixtures and Strains Trials.

Each major plot includes an area of two acres which was ploughed, cultivated, and sown with various grass and clover mixtures and rye-grass strains in the autumn of 1932. Half of each pilot plot was similarly treated and sown with strips of the same pasture mixtures. On most plots a very good establishment was secured although in some cases weeds made rapid growth during the first season.

Most of these "first-year" weeds were of an annual nature and subsequently did not cause any trouble, and it has generally been recorded that plots on which these early weeds were most troublesome have since produced the most vigorous swards. The established perennial swards have since suppressed the annual weeds and, encouraged by the higher soil fertility which appears to be characteristic of the weedy ground, these mixtures usually have made good growth.

The reverse condition is true, and it is generally found on those plots which were exceptionally free from weeds during the first season that the established swards have since lost vigour and either flat weed and plantain or bare space is now most conspicuous.

In the first years the annual and short-lived species of grasses and clovers were very prominent, but in most plots they have disappeared and only the perennial or persistent annual species survive. Detailed notes concerning the establishment and persistence of the various individual sown species are to be found in the 1935 report (May *Journal*).

Except on the Gippsland hill country, where cocksfoot is dominant, perennial rye-grass continues to be the outstanding pasture grass throughout the plots. It predominates on most of the areas, and making useful growth from the first autumn rains until the late spring it usually contributes more to the bulk of feed than any other grass species.

At the time that these plots were established Hawke's Bay (New Zealand) rye-grass was attracting much attention, and in order to compare it with the local strains of perennial rye-grass under varying conditions, it was sown in plots alongside strips of Clunes, Colac, and Gippsland old pasture rye-grass. In most cases there has been no appreciable difference between the vigour and persistence of these various strains, and only on the cocksfoot dominant Gippsland hill country has there sometimes been indications that the later growing Hawke's Bay type is rather more persistent than the local Victorian strains.

The short-lived types of rye-grass including Wimmera, South Island New Zealand, Irish and Italian rye-grass have long since died out, clearly demonstrating the futility of attempting to establish permanent pastures in southern Victoria with any rye-grass which is not of truly persistent perennial character.

As expected, cocksfoot made vigorous growth on the Gippsland hill plots, and from its behaviour on the plots in the Western District it would appear to have a definite future there in pasture mixtures. For general seasonal productivity it could not be compared with perennial rye-grass, but when included in the pasture mixture and when present in small amount only it has provided most useful late green feed and responded well to late spring and summer rains.

Phalaris generally has made poor progress, but on a few plots, usually on the deep fertile soils, it has made very strong growth. Its development has no doubt been favored by the practice of allowing the species plots to make unrestricted growth in the spring, and on those areas to which it is well adapted it has effectively suppressed the competing rye-grass. This result, however, has been achieved only on areas favorable to the growth of Phalaris, and on most of the plots in southern Victoria the perennial rye-grass, making stronger development, has suppressed the Phalaris.

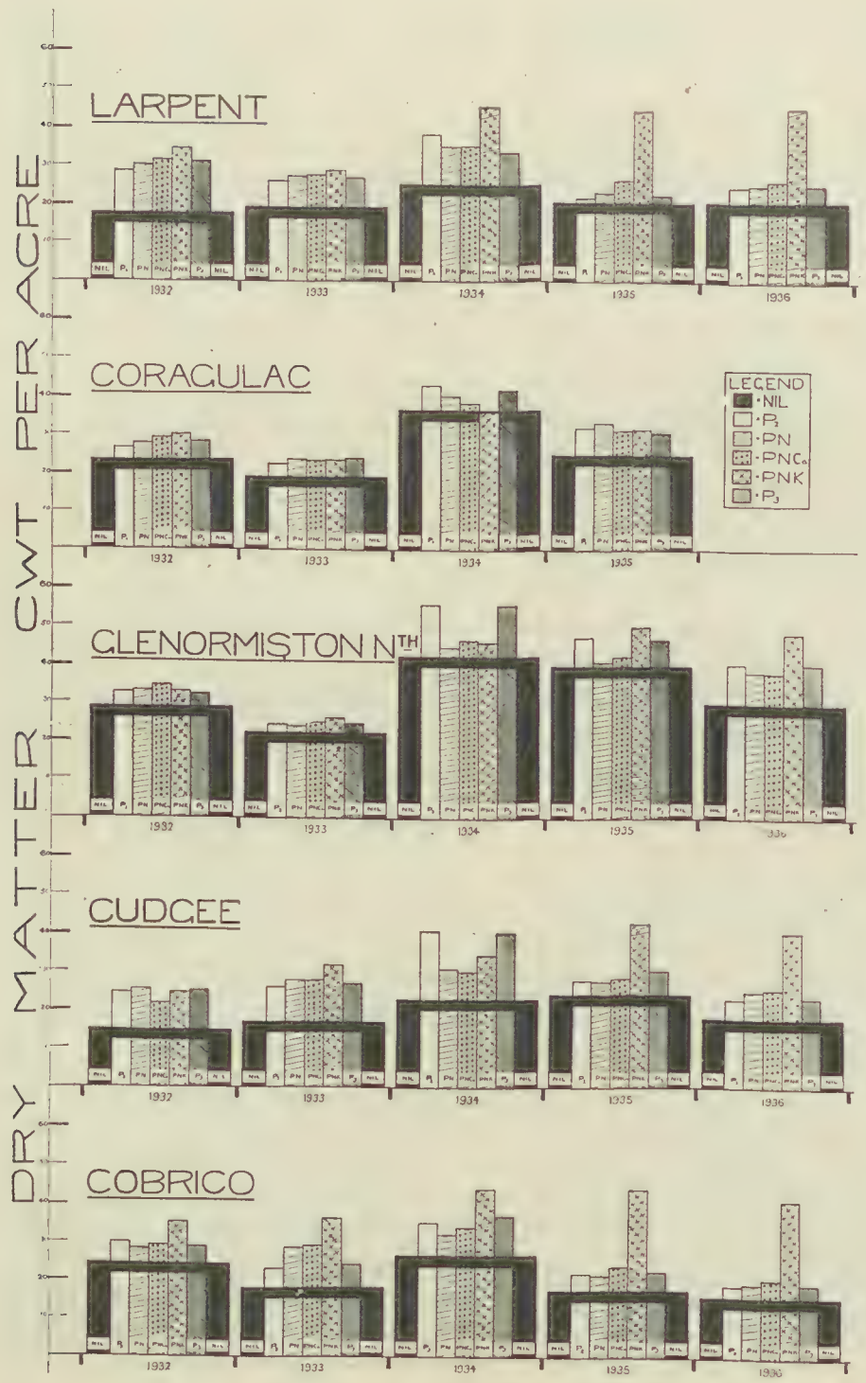
The other grass species sown in the mixtures usually are to be found in small amount, but it is rarely that they have made much headway and only in a few special cases are they making promising growth. Brown top and Chewings fescue have maintained close swards but, though persistent, they can hardly be regarded as productive.

Subterranean clover has made good growth on most plots, usually forming a vigorous balanced pasture with rye-grass and cocksfoot, and it is only on open swards or where the perennial grasses have failed that this clover has tended to become too aggressive. Although an excess of subterranean clover is undesirable it has been very noticeable that, where rye-grass or cocksfoot are growing without the clover, grass growth is lacking in vigour and is unpalatable to stock.

White clover was included in all the plots, but it is in some of the wetter locations only that it has made satisfactory development. It usually is found making good growth under very favorable pasture conditions, but for general usefulness on the dry land pastures in Victoria it is not to be compared with subterranean clover. Its growth is mainly restricted to situations that remain damp and moist during the summer period, but on dry land it does not make a satisfactory response to occasional summer showers.

These pasture mixture and strain trials were commenced in 1932 and now, after the completion of the fifth year, they show some very interesting comparisons of the relative persistency of the various species. At the same time they also serve to show that persistent perennial species do not necessarily provide vigorous productive pastures. No better example of persistent perennial yet relatively unproductive, pastures could be quoted than the native pastures composed mainly of Danthonia or Eragrostis and the ever present flat weed. Brown top, Chewings fescue, and Kentucky blue grass have played a similar part on most of the sown pasture mixture trials and even rye-grass, cocksfoot, and Phalaris, though thoroughly persistent, may become unproductive under unfavorable soil conditions.

Persistent perennial species are the main components of our best pastures, but here their productivity is due mainly to the high soil fertility



Comparative Yearly Growth on Pasture Manurial Trials, 1932-36.

Left—Western District. Right—Gippsland.

The manurial dressings indicated in the legend are as follows —

NIL = No Manure.

P_2 = Superphosphate 2 cwt. per acre.

PN = Super. 2 cwt., + Sulphate of Ammonia 1 cwt. p.a.

PNCa = Super. 2 cwt. + Sulphate of Ammonia 1 cwt. + Lime 1 ton (1932 only) p.a.

PNK = Super. 2 cwt. + Sulphate of Ammonia 1 cwt. + Potash 1 cwt. p.a.

P_3 = Super. 3 cwt. per acre.

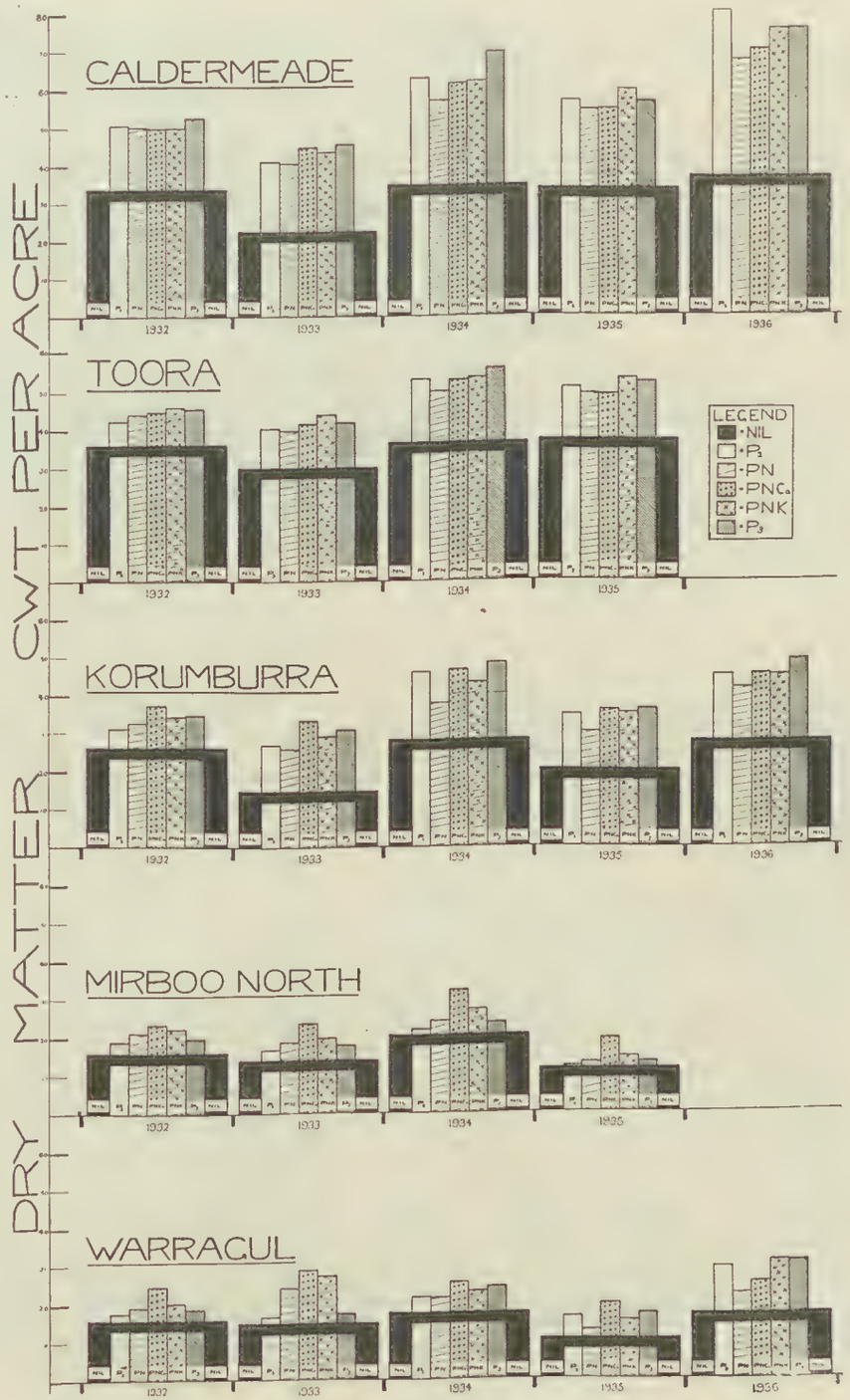
Total growth for each year (March 1st to February 28th) measured in cwt. of dry matter per acre is indicated by the height of the vertical columns. "No manure" plot yield, shown in black, has been continued across the columns representing the yield from the manurial treatments to indicate the increase due to the fertiliser.

It will be seen that though the potash treated plots did not show any marked increase over the "super. only" plots in the first years, the yields of the "super. only" plots have since declined, and the super. plus potash plots show large increases. The super. 3 cwt. plots do not show any material increase over the 2 cwt. dressings.

At Warragul and Mirboo North, lime given in addition to superphosphate and sulphate of ammonia showed, in the first years, a good increase in yield, but more recently at Warragul the effect of the lime has diminished while the response to supr. alone has greatly improved.

These charts show the total yearly growth only. The variations in seasonal growth and the influence of fertilizer in promoting early spring growth are shown on the other seasonal production graphs.

The variation in height of the "no manure" columns from year to year is mainly the effect of the growing conditions experienced. The "no manure" plots usually have not grown strongly enough to show signs of exhaustion of plant food due to repeated mowings.



and favorable moisture conditions. On some of these plots situated on the poorer soils the swards still consist of persistent species, but they lack vigour and are relatively unproductive.

Providing a reasonably suitable pasture mixture is sown it would seem that the vigorous growth of the resultant pasture (excluding weather conditions) would depend on fertility of the soil. Further, if the pasture is to be maintained in a productive condition, soil fertility must be maintained at a suitably high level. Rich soils will maintain productive pastures almost irrespective of the treatment they might be given, but if vigorous pastures are to be maintained on ordinary soils skilful management will be required.

Skilful management involves the maintenance of a good proportion of clover in the sward, regular dressings of fertilizer, the breaking and distribution of animal droppings, regular grazing of the pasture and the avoidance of holding old dry feed on the field, or frequent cutting of the same paddock for meadow hay.

Results of Major Plots

GIPPSLAND AND WESTERN DISTRICT

A summary of the general results obtained from the manurial trials is shown in Tables VI. and and XII. Details of the earlier results are given in the second, third, and fourth years' reports published in the April, 1934, May, 1935, and April, 1936, Journals of the Victorian Department of Agriculture.

The major plots were designed to measure the effect of the various manurial treatments on pasture growth, both for total yield and for their influence on seasonal production. The mowing area on each major plot consists of an enclosure about 0·4 acre in area which has been divided into narrow strips each 80 feet long and 4 ft. 6 in. wide, there being six replications of each manurial treatment within each plot. These plots were laid down on uniform areas of typical farm paddocks levelled and prepared for cutting with a motor grass-mower. Cuttings have been made at longer intervals than would be possible with an ordinary lawn-mower and the grass usually has been cut at a stage when it would be suitable for grazing off by dairy stock.

The manurial treatments adopted are shown in the yield tables of the various plots, the main annual dressing being given in the autumn while sulphate of ammonia has been applied in the early spring only, during the past two years, and the super. 3 cwt. per acre plot has received 2 cwt. in the autumn and 1 cwt. in the early spring. These plots have afforded the opportunity of measuring the seasonal growth of typical Victorian pastures of determining the influence of manurial treatment in stimulating growth after the winter and prolonging growth into the late spring and early summer. Graphs indicating the seasonal growth of the various pastures are shown on pages 182 and 183, and while these indicate that manurial treatment might encourage extra growth in early spring even the most liberal dressings have failed to promote growth either during the dry summer period or during the winter when growth is checked by low temperatures.

Under Victorian grazing conditions stock, in the lean periods, usually do not depend on feed actually growing for their maintenance. During the summer and winter periods they are grazed on surplus feed which has been grown earlier and kept in the paddock, sometimes supplemented by stored fodder during the winter.

Superphosphate does promote growth considerably earlier in the spring, and usually the improved subterranean clover-rye-grass pastures, which it causes to develop, make better winter growth than the pastures they have replaced. The main value of super., however, in improving summer and winter grazing lies in the fact that the extra spring growth results in a greater bulk of more palatable and nutritious feed which is kept in the paddocks as dry standing feed, and is fed off as required in periods of limited growth.

When these mowing trials were first commenced it was feared that repeated defoliation with low-cutting mowers would result in abnormal swards being developed in which rosette weeds and low-growing species would be favoured. With the altered cutting cylinders on the mowers it has been found possible to allow the grass to reach an even longer stage than would be desirable for stock grazing and the growth of the low-growing plants has not been encouraged. In most cases no alteration in the botanical composition of the plots can be attributed to the mechanical action of the mower.

On the other hand, mowing and the complete removal of the pasture growth has resulted in the gradual depletion of soil fertility, and on the poorer soils this effect has now become very marked. At present this soil impoverishment

A pasture sward at Larpent. Note the weedy pasture on the super. 3 cwt. plot (left) and the improved growth and presence of clover on the super. + potash plot on the right.

seems to be due mainly to the exhaustion of the available soil potash supply and is not shown either on the plots receiving potash fertilizer or on the weakly-growing unmanured plots which have not made sufficient growth to bring about a potash deficiency.

This potash deficiency became so acute on the Larpent and Cobrico plots that it was decided to give an additional basal dressing of potash 1 cwt. per acre over the whole centre bay of each plot last year, and since then these sections have been outstandingly better than adjacent end bays which received the normal fertilizer treatment only.

Detailed Results.

Details of yields obtained in the earlier years are to be found in the previous reports, and while this report is confined mainly to the 1936 results, tables are included which show the relative yields from the various manurial treatments during the full period of the trials. Further details covering the soil and pasture types on the various plots are also to be found in the earlier reports. Fewer cuttings than usual were made during 1936 owing to the exceptionally dry weather which checked autumn and winter growth. Mowings were discontinued on the Toora, Mirboo North, and Coragulac plots after the mid-spring cuts had been made. As in previous years the manurial responses were most marked in the early spring and later in the season the increases were of a much smaller degree.

In the following tables certain abbreviations for manurial treatments are used. P represents phosphate; N, nitrogen; K, potash; and Ca, calcium; and, in this instance, these elements are supplied by superphosphate, sulphate of ammonia, muriate of potash and lime respectively.

The abbreviations are as follows:—Nil = no manure; P_2 = superphosphate 2 cwt. per acre; P_2N = super. 2 cwt. + sulphate of ammonia 1 cwt. per acre; $P_2N.Ca$ = super. 2 cwt. + sulphate of ammonia 1 cwt. + lime 1 ton per acre (1932 only); $P_2N.K.$ = super. 2 cwt. + sulphate of ammonia 1 cwt. + muriate of potash 1 cwt. per acre; P_3 = superphosphate 2 cwt. autumn 1 cwt. spring, per acre.

CALDERMEADE (J. Davis).

This plot is situated on the fertile Caldermeade flats, the soil being a deep, strong clay loam. The pasture consists of perennial rye-grass with subterranean and white clovers and some Kentucky blue grass. From the commencement an excellent response to superphosphate has been shown, and the improvement has been maintained throughout the period of the trial.

Some response to sulphate of ammonia was recorded each year in the early spring but, generally, the additional dressings of other fertilizers have not increased the yields over those of the "super. only" plots.

The results obtained from the mowing manurial trial are set out in Table I.

Table I.—Manurial Trials, Caldermeade.

Date of Cutting.	Yields in cwt. of Greenstuff per Acre.					
	Nil.	P_2.	P_2N.	$P_2N.Ca$.	$P_2N.K$.	P_3.
1936.						
June 2 ..	11	58	52	68	53	64
Aug. 4 ..	5	29	29	24	44	33
Oct. 12 ..	75	163	168	157	168	165
Nov. 9 ..	54	52	48	44	48	54
1937.						
Jan. 4 ..	77	149	123	138	147	145

TOORA (J. Kroezen).

These plots are located on the Toora flats, which consist of a deep grey alluvial silt at the foot of the South Gippsland hills. Previous to establishing the plot the area had been regularly top-dressed and a good pasture, consisting mainly of perennial rye, with white and subterranean clovers had been developed.

The response to super. in the early spring was usually good, but over the year the response was not as large as might have been expected on this class of soil. Potash has been slightly beneficial, but the other fertilizers have not effected any improvement. The yields on this plot have been well sustained over the five-year period, and the response to super. has not shown any diminution.

Table II. shows the results from the Toora mowing trial.

TABLE II.—MANURIAL TRIALS, TOORA.

Date of Cutting.	Yields in cwt. of Greenstuff per Acre.					
	Nil.	P_2.	P_2N.	$P_2N.Ca$.	$P_2N.K$.	P_3.
1936.						
June 4 ..	11	23	21	20	22	28
Aug. 5 ..	4½	8¼	7	6	6¾	9
Oct. 13 ..	47	63	53	54	56	70

KORUMBURRA (F. E. Kurrle).

The Korumburra plot is situated south of the township on typical grey hill loam. The pasture is made up largely of Yorkshire fog, cocksfoot and subterranean and white clovers. This pasture had previously been top-dressed and was in a vigorous condition when the plots were established. The response to super. on this plot has been marked and, in the first years, lime in addition gave a further increase in growth. This good improvement, due to lime, has not been sustained on the mowing trial, although the treated plot has yielded better than the plot receiving super. and sulphate of ammonia.

Compared with the " super. only " plot, sulphate of ammonia given in addition has considerably lowered the yield, but this effect has become less marked since the autumn dressing was omitted and the nitrogenous dressing given in the spring only.

The weights obtained from the mowing tests are shown in Table III.

TABLE III.—MANURIAL TRIALS, KORUMBURRA.

Date of Cutting.	Yields in cwt. of Greenstuff per Acre.					
	Nil.	P_2.	P_2N.	$P_2N.Ca$.	$P_2N.K$.	P_3.
1936.						
June 3 ..	5	10	6	12	101	16
Aug. 5 ..	1½	5	3	3¾	4½	6
Oct. 15 ..	19	73	67	81	80	75
Nov. 9 ..	29	42	38	40	41	41
1937.						
Jan. 5 ..	68	82	82	81	80	91

MIRBOO NORTH (R. E. Barrand).

The pasture at Mirboo North consists mainly of Yorkshire fog, cocksfoot, red clover, with much flat weed and plantain. The soil is a deep, porous red clay, typical of the Gippsland red hill country.

This plot has never shown any material response to superphosphate alone, but when lime and sulphate of ammonia were applied in addition there was a marked improvement in growth. The mowing plots receiving lime have always shown some increase in growth, but the improvement has been most marked on the rotational grazing plots where the super. and lime and sulphate of ammonia treatment has completely changed the sward and produced a strong, healthy pasture. Further plots recently established in the district have confirmed the fact that lime, in addition to super., is generally beneficial on this type of soil.

The weights of produce obtained from the mowing trial are set out in Table IV.

TABLE IV.—MANURIAL TRIALS, MIRBOO NORTH.

Date of Cutting.	Yields in cwt. of Greenstuff per Acre.					
	Nil.	P_2.	P_2N.	$P_2N.Ca$.	$P_2N.K$.	P_3.
1936.						
June 9 ..	2	2½	3	3½	2¼	2½
Oct. 14 ..	3¾	5½	5	10	7	7
Nov. 11 ..	9¾	14	13	19	16	20

WARRAGUL (C. Tyssen).

The Warragul pasture consists of cocksfoot, red clover and flat weed with a rapidly increasing proportion of subterranean clover. The soil is the deep, porous red clay of the Gippsland hills.

In the first years, when the pasture consisted of cocksfoot and red clover, the response to super. was small, but lime, and lime and nitrogen, in addition, gave good results. Recently subterranean clover has appeared on the mowing area and the response to super. alone is good. During

the past year improved results from potash have been recorded, and one of the cross strips on the grazing area has been quite marked.

Table V. shows the results of the mowing tests.

TABLE V.—MANURIAL TRIALS, WARRAGUL.

Date of Cutting.	Yields in cwt. of Greenstuff per Acre.					
	Nil.	P_2.	P_2N.	$P_2N.Ca.$	$P_2N.K.$	P_2.
1936.						
June 10 ..	1	1½	1½	2¼	2	2
Oct. 16 ..	9½	43	31	49	53	49
Nov. 18 ..	26	41	33	35	40	42
1937.						
Jan. 14 ..	44	58	44	40	57	57

TABLE VI.—SHOWING RELATIVE PRODUCTION FROM VARIOUSLY MANURED PLOTS (MOWING TRIALS)—GIPPSLAND, 1932 TO 1936.

The production of the unmanured plots is expressed as 100. The "year" extends from 1st March to 28th February, except for the year 1932, when the mowing did not commence until July.

Year.	Nil.	P_2.	P_2N.	$P_2N.Ca.$	$P_2N.K.$	P_2.
Caldermeade.						
1932 ..	100	151	148	147	147	156
1933 ..	100	183	181	199	194	202
1934 ..	100	182	165	178	179	202
1935 ..	100	168	161	162	177	168
1936 ..	100	203	189	194	206	207
Toora.						
1932 ..	100	118	122	125	128	127
1933 ..	100	135	133	139	147	141
1934 ..	100	145	137	145	147	154
1935 ..	100	137	133	132	144	141
Korumburra.						
1932 ..	100	118	125	143	131	132
1933 ..	100	184	178	228	199	210
1934 ..	100	163	134	165	153	171
1935 ..	100	170	148	177	172	179
1936 ..	100	173	160	178	177	187
Mirboo North.						
1932 ..	100	119	135	148	140	125
1933 ..	100	121	136	172	144	130
1934 ..	100	107	118	157	132	116
1935 ..	100	105	113	170	127	115
Warragul.						
1932 ..	100	111	122	156	128	119
1933 ..	100	112	162	194	183	118
1934 ..	100	123	122	145	131	137
1935 ..	100	153	120	186	144	163
1936 ..	100	179	136	157	189	188

WESTERN DISTRICT.

LARPENT (J. J. Rogers).

The plot at Larpent is situated on a deep, strong, sandy loam and the pasture, which had previously received little top-dressing, consisted of perennial rye and subterranean clover. At the beginning of the trials these plots showed a very striking response to superphosphate alone, and a further small response to potash. The response to super. has not been sustained, except where potash has been applied also. Sulphate of ammonia gave an excellent response on this plot in the first season, but its effect on the sward was subsequently bad and silver grass has largely replaced the perennial rye-grass.

The response to potash has become increasingly large each year, whereas the super. response has rapidly declined. This plot has suffered severely from the repeated mowing, the sward has greatly deteriorated and Yorkshire fog, flat weed, sorrel and silver grass have replaced the perennial rye and subterranean clover on those plots, which have been supered but have not received potash. A dressing of 1 cwt. potash per acre was given to the centre section of the mowing plots early in 1936 and this greatly improved the growth on this portion as compared with the two end sections. The cross strip of potash on the grazing areas has

A "no manure" sward—Larpent, 1936. Note the density but lack of growth of subterranean clover, the presence of flat weed and weak grass growth.

shown a very marked improvement in the pasture growth and composition of the sward.

The results obtained from the mowing manurial section are set out in Table VII.

TABLE VII.—MANURIAL TRIALS, LARPENT. (FOUR REPLICATES ONLY).

Date of Cutting.	Yields in cwt. of Greenstuff per Acre.					
	Nil.	P_2.	P_2N.	$P_2N.Ca$.	$P_2N.K$.	P_2.
1936.						
July 28 ..	1½	3½	2	2¾	10	3
Sept. 28 ..	7	15	19	24	73	12
Nov. 2 ..	58	64	60	63	98	71
Dec. 15 ..	38	41	45	44	52	42

CORAGULAC (E. W. Martin).

The pasture on this rich volcanic clay soil at Coragulac consisted mainly of perennial rye-grass with some nodding clover (*Trifolium cernuum*). This soil is noted for its fertility and has not shown any marked response to the manurial treatments. Good responses to sulphate of ammonia have been recorded in the early spring, but these have been followed by depressed growth on the treated areas. Neither the mowing nor the grazing plots have shown a satisfactory response to the fertilizer treatment, and though the response has increased somewhat of recent years, it is still comparatively small.

Table VIII. shows the weights obtained from the Coragulac mowing trial.

TABLE VIII.—MANURIAL TRIALS, CORAGULAC.

Date of Cutting.	Yields in cwt. of Greenstuff per Acre.					
	Nil.	P_2.	P_2N.	$P_2N.Ca$.	$P_2N.K$.	P_2.
1936.						
July 31 ..	7¼	7½	6¼	6¾	5½	6¼
Oct. 6 ..	65	74	85	77	80	68

GLENORMISTON NORTH (K. Atkins & A. S. Noel).

At Glenormiston North the pasture consisted of perennial rye, subterranean clover and Yorkshire fog, and had previously received several applications of superphosphate. The soil is a deep, fertile, clay loam, largely composed of volcanic ash from Mt. Noorat, which is a few miles to the south-west.

This plot has always carried a vigorous pasture and the "no manure" strips appear to have benefited from the residual effect of the earlier manurial applications. The supered plots usually have shown to advantage in the early spring, but their total improvement over the yearly period has been small. Super. 3 cwt. per acre has not brought about any better growth than the 2 cwt. dressing. During the past two years potash responses of an increasing magnitude have been recorded.

The results of the weighed mowing manurial trial are set out in Table IX.

TABLE IX.—MANURIAL TRIALS, GLENORMISTON NORTH.

Date of Cutting.	Yields in cwt. of Greenstuff per Acre.					
	Nil.	P_2.	P_2N.	$P_2N.Ca$.	$P_2N.K$.	P_2.
1936.						
July 29 ..	4	20	13	18	25	21
Oct. 1 ..	67	102	109	107	146	106
Nov. 4 ..	64	55	53	50	55	56
Dec. 18 ..	31	44	42	39	48	41

CUDGEE (E. R. Murfitt).

The Cudgee soil is a fine sandy loam of good depth. The pasture consists of perennial rye and subterranean clover with cocksfoot and annual grasses. Having been top-dressed for some years it was in a vigorous condition when the plots were established. An excellent response to super. was obtained in the first years, but during the past two years the swards on the "super. only" plots have weakened and their productivity has declined. The super. 3 cwt. plots have shown no better increases than those receiving the 2 cwt. dressing. Sulphate of ammonia gave good responses in the early spring of the first years, but the swards on these plots have suffered very severely since.

TABLE X.—MANURIAL TRIALS, CUDGEE.

Date of Cutting.	Yields in cwt. of Greenstuff per Acre.					
	Nil.	P_2.	P_2N.	$P_2N.Ca$.	$P_2N.K$.	P_2.
1936.						
July 29 ..	4½	15	13	17	32	21
Sept. 30 ..	23	37	47	47	96	37
Nov. 5 ..	42	35	37	38	50	35
Dec. 17 ..	12	18	18	17	15	17

Showing increased growth due to super. + potash compared with super. only—Cudgee, 1936.

Potash did not improve growth in the first years, but during the past two years it has given a large increase in growth and the swards on the potash-treated strips are very much better than those receiving super. only or super. and sulphate of ammonia. The cross strips of potash on the grazing plots have, as yet, shown a very slight improvement only.

The weights of produce obtained are shown in Table X.

COBRICO (N. Maskell).

The soil at Cobrico is a shallow buckshot silt originally carrying a poor native pasture, but one which has been improved by regular top-dressing for some years. At the time of establishing the plots there was a good sward of perennia rye, Yorkshire fog, sweet vernal, white and subterranean clovers. The improvement due to super. on this land prior to establishing the plot had been very good, but of later years there were indications that the response was declining.

From the beginning of the plots the response to super. has never been large, and though lime has appeared to have effected an improvement in the grazing area no responses from this material have been seen on the mowing plots. Super. 3 cwt. per acre has not shown any better growth than the 2 cwt. plots. On the other hand, potash has shown an excellent response right from the start, and the increases have become even more marked each year.

Though the responses to potash are most marked on the mowing plots they are also quite large on the strip across the grazing areas. During the winter and well into the spring the growth on the strips receiving no potash was almost at a complete standstill, while the treated areas showed up in marked contrast as fresh green, and growing. This improved growth is largely due to the increased growth of clover, but all the pasture species have been encouraged to grow more strongly. From these results it would appear that an acute potash deficiency has been reached on these plots and there is much evidence to suggest that a similar condition is being approached on many of the farms in the district.

TABLE XI.—MANURIAL TRIALS, COBRICO, (FOUR REPLICATES ONLY).

Date of Cutting.	Yields in cwt. of Greenstuff per Acre.					
	Nil.	P_2.	P_2N.	$P_2N.Ca$.	$P_2N.K$.	P_2.
1936.						
July 30 ..	2¼	3½	2½	3	3¼	1¾
Oct. 2 ..	10	16	21	22	93	15
Nov. 5 ..	27	33	34	36	75	35
Dec. 18 ..	46	49	47	49	54	52

Showing Spring growth on a Western District major plot.

The manurial responses are indicated by the weights of produce obtained and shown in Table XI.

TABLE XII.—SHOWING RELATIVE PRODUCTION FROM VARIOUSLY MANURED PLOTS (MOWING TRIALS)—WESTERN DISTRICT, 1932 TO 1936.

The production of the unmanured plots is expressed as 100. The "year" extends from 1st March to 28th February, except for the year 1932, when the mowing did not commence until July.

Year.	Nil.	P_2.	P_2N.	$P_2N.Ca$.	$P_2N.K$.	P_2.
Larpent.						
1932 ..	100	162	170	178	195	176
1933 ..	100	137	142	144	150	140
1934 ..	100	151	139	139	180	133
1935 ..	100	105	113	128	215	110
1936 ..	100	120	122	129	226	123
Coragulac.						
1932 ..	100	114	120	126	129	121
1933 ..	100	119	125	123	124	127
1934 ..	100	117	109	105	99	114
1935 ..	100	128	133	125	127	124
Glenormiston North.						
1932 ..	100	114	116	121	115	113
1933 ..	100	109	107	112	117	110
1934 ..	100	132	106	110	109	132
1935 ..	100	118	103	106	126	118
1936 ..	100	133	131	129	165	135
Cudgee.						
1932 ..	100	163	170	147	164	168
1933 ..	100	153	164	164	187	159
1934 ..	100	178	135	132	150	176
1935 ..	100	116	114	117	176	125
1936 ..	100	131	142	147	239	136
Cobrico.						
1932 ..	100	122	115	119	144	118
1933 ..	100	129	160	162	202	135
1934 ..	100	132	121	128	166	138
1935 ..	100	126	124	137	253	128
1936 ..	100	118	122	129	264	121

Mowing Trials—New Series.

During the winter of 1935 a number of small mowing trials was established at Larpent, Cobden, Mirboo North and Warragul to determine if the responses previously recorded on major plots in these localities were applicable to the surrounding districts. A description of the plots and the type of pasture on each was given in the Annual Report for 1935. (*Journal of Agriculture*, April, 1936), but the complete yields obtained are shown in the following tables.

GIPPSLAND.

These tests are situated in the Warragul and Mirboo North districts to study the effect of lime on the red hill country pastures.

LARDNER (R. S. Teese).

The pasture at Lardner had previously received regular heavy dressings of super. and as a result had been greatly improved. A feature of this plot has been the high yield sustained on the "no manure" strips, no doubt due to the previous treatment. Lime has not shown any useful effect on this plot.

The results obtained are shown in Table XIII.

TABLE XIII.—MANURIAL TRIALS, LARDNER.

Date of Cutting.	Yields in cwt. of Greenstuff per Acre.						
	Nil.	P_2.	P_2N.	$P_2N.Ca$.	P_2Ca.	N.Ca.	Ca.
1935.							
Sept. 19	74	70	89	89	82	86	..
Oct. 30	99	93	89	89	97	87	..
Nov. 27	33	26	27	30	31	25	27
1936.							
Jan. 24	4½	5	4½	5	5½	5½	5
April 15	3½	3½	3½	4½	5	5	4
June 10	2½	3	3	4½	4	3½	2½
Aug. 11	9½	8½	8	10½	12½	8	7
Oct. 15	95½	90	95½	94½	86	96½	74½
Nov. 19	52½	53½	54	46½	49½	48	47½
1937.							
Jan. 14	64	66½	60½	52	61	48½	64

WARRAGUL (C. Tyssen).

The Warragul plot has been established close to the original major plot mowing area on similar soil but on a very different type of pasture. The old area had a cocksfoot-red clover pasture, while on this new section the pasture consists of Yorkshire fog, flat weed, plantain, Danthonia and subterranean and suckling clovers, with very little cocksfoot and rye-grass.

Unlike the old major plot this trial has shown a good response to super. while the increase due to lime has been small only. Growth has been sustained well into the summer, and an unusually heavy cut was taken off in January.

Table XIV. shows the yields obtained from these plots.

TABLE XIV.—MANURIAL TRIALS, WARRAGUL (C. TYSSEN).

Date of Cutting.	Yields in cwt. of Greenstuff per acre.						
	Nil.	P_2.	P_2N.	$P_2N.Ca$.	P_2Ca.	N.Ca.	Ca.
1935.							
Oct. 4	10	21	34	27	17	13	..
Nov. 13	52	68	72	69	63	53	49
Dec. 6	23	30	32	38	35	29	22
1936.							
Jan. 24	15	19½	18	22	23½	21½	21
June 10	1½	2	2	2	2	1½	1½
Aug. 11	1/10	½	½	1	1	½	½
Oct. 16	17	52	68½	88	71½	25	16½
Nov. 18	41½	66	60½	57½	65	43½	36½
1937.							
Jan. 14	59	69½	67	78½	76	53½	62

WARRAGUL (C. J. Snape).

The pasture on Mr. Snape's area consisted mainly of cocksfoot with a little red and white clovers. It had previously been top-dressed with superphosphate for some years and not much response to super. has been shown on these plots. The dressings of lime given in addition to super. have shown very little response.

The weights of produce obtained are shown in Table XV.

TABLE XV.—MANURIAL TRIALS, WARRAGUL (C. J. SNAPE).

Date of Cutting.	Yields in cwt. of Greenstuff per Acre.						
	Nil.	P_2.	P_2N.	$P_2N.Ca$.	P_2Ca.	N.Ca.	Ca.
1935.							
Oct. 4	13	16	22	24	16	22	..
Oct. 30	26	27	25	32	32	30	..
Dec. 7	34	36	37	40	41	35	36
1936.							
Jan. 23	9	10	9½	10	10	9	7½
June 10	4½	6½	5½	6½	6½	6½	5
Aug. 11	2½	4½	4½	5½	5	2½	2
Oct. 16	61½	91	87	92	82	52	49
Nov. 19	44	39	36½	40	43½	45½	42½
1937.							
Jan. 14	64½	72½	60½	71	79½	63½	55½

MIRBOO NORTH (Edney Bros.).

This pasture at Mirboo North, consisting of Yorkshire fog, cocksfoot and Danthonia, with some flat weed and subterranean clover, had previously received top-dressings of superphosphate. These plots have continued to show a fair response to super. and at times there has been a good response to lime in addition, though lime on its own has given poor results only. The response to sulphate of ammonia in the early spring has been marked.

Table XVI. indicates the weight of produce obtained.

TABLE XVI.—MANURIAL TRIALS, MIRBOO NORTH (EDNEY BROS.).

Date of Cutting.	Yields in cwt. of Greenstuff per acre.						
	Nil.	P_2.	P_2N.	$P_2N.Ca$.	P_2Ca.	N.Ca.	Ca.
1935.							
Sept. 20	10	10	22	17	10	15	..
Nov. 8	49	57	62	1	69	53	42
Dec. 5	21	25	24	25	26	21	21
1936.							
Jan. 23	11	11	11	11½	11	10½	12
June 8	2½	3	3½	5	4½	3½	3½
Aug. 7	1	1½	2	3	3	1½	1½
Oct. 14	13	37½	54	72½	59½	30½	23
Nov. 10	37	60	51½	49	55	41½	43
1937.							
Jan. 7	71	118	94½	102	115	68½	75½

MIRBOO NORTH (L. J. Austin).

Mr. Austin's pasture consisted of cocksfoot, rye-grass with some plantain and flat weed and its growth was lacking in vigor.

In the first year the super.-treated plots showed a small improvement over the unmanured strips, but there was no response to the lime treatment. During the past year there has been a better response to the lime, and in the early spring the

TABLE XVII.—MANURIAL TRIALS, MIRBOO NORTH (L. J. AUSTIN).

Date of Cutting.	Yields in cwt. of Greenstuff per Acre.						
	Nil.	P_2.	P_2N.	$P_2N.Ca$.	P_2Ca.	N.Ca.	Ca.
1935.							
Oct. 3	8	10	20	19	8	16	..
Nov. 8	30	45	42	46	42	39	39
Dec. 5	21	27	22	25	26	21	20
1936.							
Jan. 22	10	10	10	11	10½	9½	10½
June 9	4½	5½	5	6	6	5½	6½
Aug. 7	½	1	1	1½	1½	1	1½
Oct. 14	8	14½	24	40½	26½	23	18
Nov. 10	20	30½	29½	38	42½	30½	31
1937.							
Jan. 7	62	92	77½	106	111½	68	86

response to sulphate of ammonia was quite good. Growth during the past spring was poor, but the season was late and the heaviest cut was taken off in January.

The results are set out in Table XVII.

LIMONITE (G. W. Bickerton).

This pasture at Limonite was more vigorous than those usually found in the district, and consisted of subterranean clover, cocksfoot, Yorkshire fog, with some rye-grass, Danthonia and flat weed.

It has shown a fair response to super. and a good response to super. and lime. Sulphate of ammonia has not given much response and lime alone has been poor.

The results obtained to date are shown in Table XVIII.

TABLE XVIII.—MANURIAL TRIALS, LIMONITE (G. W. BICKERTON).

Date of Cutting.	Yields in cwt. of Greenstuff per Acre.						
	Nil.	P_2.	P_2N.	$P_2N.Ca$.	P_2Ca.	N.Ca.	Ca.
1935.							
Sept. 20	21	23	37	36	29	30	..
Oct. 30	69	77	74	87	96	71	62
Dec. 4	12	13	13	14	14	11	12
1936.							
Jan. 22	8½	8½	9½	8½	8½	8½	9½
June 8	8½	10½	11½	15½	14½	10	10
Aug. 7	3½	4½	4	7½	9½	4½	4½
Oct. 14	42	54	67	124½	121	58½	57½
Nov. 11	38½	41½	37½	34	38	40	45
1937.							
Jan. 6	76½	99	97	119	126	87½	78

Grazing Trial—Ellinbank.

A description of the small grazing plots at Ellinbank was given in last year's report. Grazing of these areas has been continued at intervals during the past year.

There has been a very marked response to manurial treatments on these plots, and while super. alone has given good results, the response to super. plus lime has been considerably better, and super. plus lime plus sulphate of ammonia has given even better growth still. So far, there has been no deterioration on these swards resulting from the use of sulphate of ammonia, and it is too early to determine if the nitro-chalk will be less severe on the pasture in this regard. A cross strip of potash was applied to all these plots in the winter of 1936, and later in the spring the stronger growing plots showed an excellent response from this treatment.

TABLE XIX.—SHOWING RELATIVE PRODUCTION FROM VARIOUSLY MANURED STRIPS (SMALL MOWING TRIALS), GIPPSLAND, 1936.

Location.	Nil.	P_2.	P_2N.	$P_2N.Ca$.	P_2Ca.	N.Ca.	Ca.
Lardner (R. S. Teese)	100	99	99	94	96	92	88
Warragul (C. Tyssen, No. 2)	100	160	167	191	181	104	99
Warragul (C. J. Snape)	100	120	109	121	122	96	87
Mirboo North (L. J. Austin)	100	150	144	202	197	135	150
Mirboo North (Edney Bros.)	100	177	165	185	191	116	117
Limonite (G. W. Bickerton)	100	124	122	178	183	119	116

WESTERN DISTRICT.

The new mowing trials in the Western District are located in the Colac and Cobden Districts to study the effects of potash which had previously given good responses on the major plots at these centres.

COBDEN (R. T. Stone).

This pasture at Cobden, which had been greatly improved by regular heavy dressings of superphosphate, is growing on a light buckshot soil overlying basalt. Growth consists of perennial rye, Yorkshire fog, sweet vernal and flat weed, with some white and subterranean clovers. It had

TABLE XX.—MANURIAL TRIALS, COBDEN (R. T. STONE).

Date of Cutting.	Yields in cwt. of Greenstuff per Acre.						
	Nil.	P_2.	P_2K.	P_2Ca.	$P_2K.Ca$.	$P_2N.K$.	K.
1935.							
Oct. 21	76	94	134	86	116	124	114
Nov. 12	12	12	13	12	12	12	11
1936.							
Jan. 8	15½	18½	20	16½	18	19	17
July 29	13	22	51½	20½	40	17½	24½
Oct. 5	33	42	114	37	113½	117	60½
Nov. 4	37½	40	44½	38½	39	47	45
Dec. 17	52½	49½	53½	53½	65½	57½	48½

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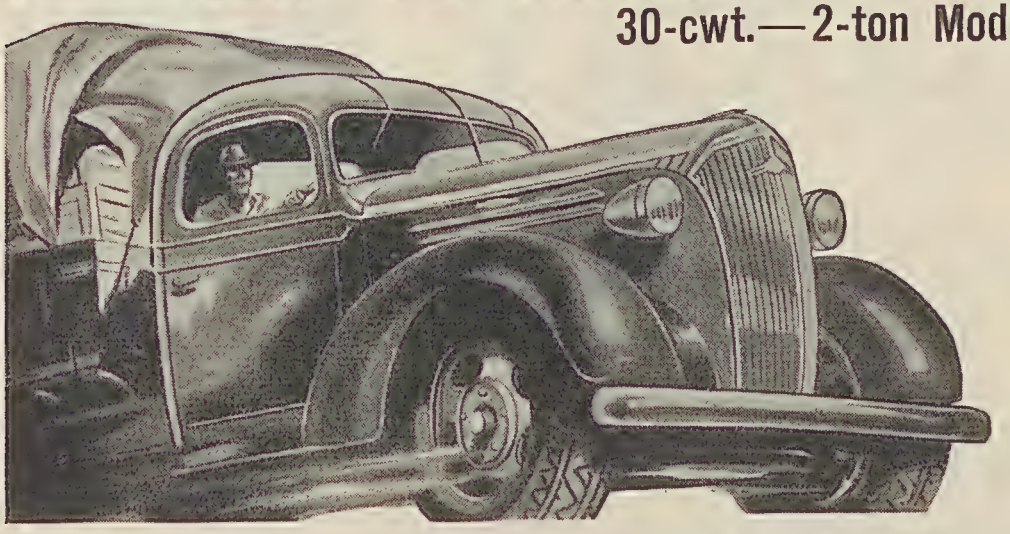

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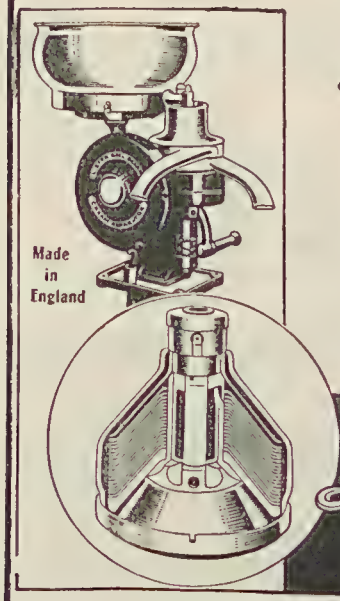

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been observed that on this pasture the response to superphosphate was declining during recent years. The plot results have shown very little response either from super. alone or super. plus lime, but where potash has been applied the yields have been considerably increased.

The yields obtained are shown in Table XX.

COBDEN (J. Errey).

The soil on Mr. Errey's plot is a grey buckshot loam overlying basalt. The pasture which was not vigorous had been regularly "supered" for some years during which time it had shown a good response, but had since declined. Growth consisted mainly of sweet vernal, perennial rye, flat weed, Kentucky blue, crested dogstail, and a little white and suckling clovers.

TABLE XXI.—MANURIAL TRIALS, COBDEN (J. ERREY).

Date of Cutting.	Yields in cwt. of Greenstuff per Acre.						
	Nil.	P_2.	P_2K.	P_2Ca.	$P_2K.Ca$.	$P_2N.K$.	K.
1935							
Oct. 21	36	44	57	39	63	75	51
Nov. 12	14	15	18	14	18	18	17
1936.							
Jan. 8	13½	15½	19½	13	20	16½	18
July 29	4½	9½	20½	7	31	20½	10
Oct. 5	12	23½	73	22½	104½	91	26½
Nov. 4	28	31	52½	30½	44	47½	42½
Dec. 16	53	56	73	53½	74	67½	65

The super., and super. and lime plots have been very little better than the unmanured strips, but where potash has been applied the yields have shown a marked increase.

The results are set out in Table XXI.

COBDEN (L. Vagg).

This Cobden plot is situated on a deep buckshot silt loam overlying basalt. The pasture which is normally quite vigorous consists mainly of perennial rye and white clover, with Yorkshire fog, sweet vernal, flat weed and suckling and subterranean clovers.

There was a fair response to super. and a small response to potash in the first season, but during the past year there have been good responses both to super. and potash. Lime has not shown any improvement at all.

TABLE XXII.—MANURIAL TRIALS, COBDEN (L. VAGG).

Date of Cutting.	Yields in cwt. of Greenstuff per Acre.						
	Nil.	P_2.	P_2K.	P_2Ca.	$P_2K.Ca$.	$P_2N.K$.	K.
1935.							
Sept. 12	33	37	49	39	38	61	29
Oct 23	112	145	160	141	144	144	116
Nov. 12	13	14	13	15	13	14	12
1936.							
Jan. 8	15½	18½	17	20½	18½	16½	15½
July 30	17	60	81½	58½	72	62	14
Oct. 2	39½	88½	114	90½	116½	120½	36½
Nov. 4	53½	54	48½	52½	46½	45½	52½
Dec. 16	47	54½	56	57	53½	53½	44

Showing the marked contrast between plots treated with super. + potash (left) and super. only—Cobden (J. Roberts) 1936.

This plot has made much better winter and early spring growth than the other Cobden plots on which the response to potash has been more marked.

The weights of produce obtained from these plots are shown in Table XXII.

COBDEN (J. Roberts).

The pasture on Mr. Roberts' plot consists of perennial rye, subterranean clover, Yorkshire fog, sweet vernal, with flat weed and bent grass.

The pasture had previously received little or no superphosphate and the super. 2 cwt. strips have shown a good response to this treatment. The response to potash when applied with super. has also been very good. Neither lime nor sulphate of ammonia has shown any improved pasture growth.

Table XXIII. shows the results to date.

TABLE XXIII.—MANURIAL TRIALS, COBDEN (J. ROBERTS).

Date of Cutting.	Yields in cwt. of Greenstuff per Acre.						
	Nil.	P_2.	P_2K.	P_2Ca.	$P_2K.Ca$.	$P_2N.K$.	K.
1935.							
Oct. 23	70	105	136	93	100	129	74
Nov. 13	10	11	12	11	14	13	11
1936.							
Jan. 8	11	11½	15	13½	13	13	11½
July 30	11½	39	47	38½	49	41	13
Oct. 5	20	67½	109½	68	112	104	27
Nov. 5	33½	40	40	37½	44	41½	36
Dec. 16	38½	53½	69	57	70½	71½	38½

COLAC WEST (J. McRae).

The soil at Colac West is a deep sandy loam and the pasture consists of perennial rye and subterranean clover, with silver grass, flat weed and cape weed. The pasture had received little or no top-dressing and the vigor of growth was low. It has shown a very marked response to superphosphate and a further good response to potash where this material was applied with super. Potash applied alone has shown very little better growth than the "no manure" plots. Neither lime nor sulphate of ammonia has shown any improvement.

The results obtained are shown in Table XXIV.

TABLE XXIV.—MANURIAL TRIAL, COLAC WEST (J. McRAE).

Date of Cutting.	Yields in cwt. of Greenstuff per Acre.						
	Nil.	P_2.	P_2K.	P_2Ca.	$P_2K.Ca$.	$P_2N.K$.	K.
1935.							
Sept. 10	11	26	33	27	32	37	11
Oct. 15	41	88	104	84	96	90	47
Nov. 15	29	48	50	47	52	46	31
1936.							
July 27	12	65½	106	65½	93½	72	13
Sept. 28	30½	97	117	95½	104	105	35½
Nov. 3	58½	92	97½	100	103	101	66½
Dec. 15	24	38½	39	37½	41	40	24½

LARPENT PARK ESTATE (N. Watchorn).

The soil on the Larpent Park Estate is a good deep sandy loam carrying a vigorous pasture of perennial rye, Yorkshire fog, subterranean clover, with some suckling clover and flat weed. In the autumn, previous to establishing this plot, the pasture had received superphosphate at the rate of 1½ cwt. per acre, and in the first year the "no manure" strips yielded as well as the supered strips.

During the past year the effect of the previous dressing had become exhausted and the super. plots showed a good increase over the "no manures." Potash has shown some response in the past year, but neither lime nor sulphate of ammonia has effected any improvement.

The yields of greenstuff obtained to date are set out in Table XXV.

TABLE XXV.—MANURIAL TRIAL, LARPENT PARK ESTATE (N. WATCHORN).

Date of Cutting.	Yields in cwt. of Greenstuff per Acre.						
	Nil.	P_2.	P_2K.	P_2Ca.	$P_2K.Ca$.	$P_2N.K$.	K.
1935.							
Aug. 8	31	32	36	31	34	36	26
Oct. 15	22	23	25	22	21	21	20
Nov. 11	32	33	33	33	34	33	32
1936.							
Jan. 10	22	23½	22½	25	27	25½	27
July 28	15½	36½	48	29	31	29	15½
Oct. 6	56	91	109½	83½	104½	111	60
Nov. 2	42	41½	43½	45	45½	41	44
Dec. 19	59	75½	99½	78	97½	89	69

TABLE XXVI.—SHOWING RELATIVE PRODUCTION FROM VARIOUSLY MANURED PLOTS (MOWING TRIALS), WESTERN DISTRICT, 1936.

Location.	Nil.	P_2.	P_2K.	P_2Ca.	$P_2K.Ca$.	$P_2N.K$.	K.
Colac West (J. McRae)	100	233	286	238	253	272	111
Larpent Park (N. Watchorn)	100	141	174	136	156	161	109
Cobden (J. Errey)	100	123	225	116	232	260	148
Cobden (L. Vagg)	100	163	191	164	179	180	93
Cobden (R. T. Stone)	100	113	197	110	176	190	131
Cobden (J. Roberts)	100	193	257	194	249	265	111

The results obtained from the surface establishment trials in the lighter pastoral districts, the irrigated pasture tests, and the Western District pilot plots, will be discussed in a later issue of this Journal.

Fungicides and Insecticides

Brands Registered for 1937

By W. C. Robertson, Chemist.

SECTION 3 of the *Fungicides Act* 1935, No. 4295, provides for the annual registration of any pest destroyer, i.e., fungicide, insecticide, vermin or weed destroyer which any wholesale dealer intends to sell during the year.

"Wholesale dealer" is defined as any manufacturer, importer, or other person who is primarily responsible for placing the pest destroyer on the Victorian market. For the current season which ends on the last day of February, 1938, 56 persons or firms registered 361 pest destroyers, including 19 weed destroyers, 37 sheep dips, 91 dusting powders, while the remainder consisted of brands of the ordinary sprays in common use by the orchardist, vigneron, and market gardener, with a small number of miscellaneous items used by the home gardener.

A general view of lime sulphur works.

Arsenate of Lead.

The insecticide arsenate of lead, which is manufactured by causing lead oxide (litharge) to react on arsenic acid in the presence of a catalyst, is represented by ten brands in the paste form, and thirteen as dry powders. Seventy per cent. of the brands of paste are of local manufacture, while fifty per cent. of the brands of powder are imported. The reason for the larger percentage in powder form which is imported is solely a question of moisture content and the freight charges thereon. Two of the imported pastes come from England and are termed "colloidal."

A colloidal lead arsenate should be capable of passing through parchment or membrane when placed in suspension. There is not a brand of lead arsenate on the market capable of doing this wholely or in part, without the aid of certain organic wetting agents, so that the term "colloidal" as applied to lead arsenate is not strictly correct.

Referring to the use of spreaders and wetting agents, while there is no doubt that an even coating of the arsenical poison on fruit is essential, the film should be of such a thickness that a toxic dose is available for say, the codlin grub when it starts to bore in or out of the apple. In this connexion, the lodgment of the arsenate in comparatively large amounts at the calyx and stem ends may be of little benefit in controlling the depredations of the grub, particularly if an oil ovicide is used to destroy the eggs laid by the moth in the initial stages of the pest's activity. It therefore follows that the spreader and/or wetting agent used should possess "sticking" powers at least equivalent to that of the arsenate itself, otherwise the result anticipated from the use of these secondary agents may not take place.

Another point which should be considered is the probable solvent or emulsifying action of the secondary substance upon the waxes, which give the bloom to the fruit, and which, under conditions of increasing temperatures, may assist in holding the arsenate on the fruit. From the chemical standpoint, the heavy use of arsenate with the persistent use of wetters and/or spreaders without attention to "sticking" power, may result in increasing the arsenate content of the soil at the expense of the fruit.

The average composition of the brands of lead arsenate registered for the current season is as follow :—

Lead Arsenate.	Calculated on Dry Basis.			Moisture.
	Arsenic Pentoxide (As_2O_5) Soluble in Water.	Arsenic Pentoxide (As_2O_5) Total.	Acidity as Nitric.	
	%	%	%	%
Paste	31·25	·43	·2	50·0 (max.)
Powder ..	31·32 (min.)	·46 (max.)	·2 (max.)	..
Proclaimed Standard	31·0 (min.)	·5 (max.)	·2 (max.)	50·0 (max.)

From the table it will be seen that—

(*a*) The average percentage composition on the dry basis of the lead arsenates on the Victorian market is almost identical, irrespective of brand, country of origin, or whether in the form of paste or powder;

(*b*) The average composition of the lead arsenates registered when calculated on the dry basis, closely approximates the proclaimed standard; and

(*c*) One pound of powder is equal to two pounds of paste.

Calcium Arsenates.

Calcium arsenate is made by adding a calcium salt to sodium arsenate in alkaline solution, or by neutralizing arsenic acid with calcium hydrate.

This arsenate, although it contains more arsenic oxide than lead arsenate, is not used as a control for the codlin grub in Victoria because of its comparatively high solubility in water which produces burn or damage to fruit and foliage. The registrations are necessary because of the demand for use as an insecticide in floriculture, &c.

Bluestone or Copper Sulphate.

There is little cause for comment on the fifteen registrations of copper sulphate, excepting to say that "neige" or "snow" crystals are coming into prominence for the manufacture of orchard-made instantaneous Bordeaux mixture.

The purity of the brands of copper sulphate registered approximates 98 per cent., which is the usual purity of the commercial article. It should be noted, however, that the quality of Bordeaux mixture manufactured by any method will depend just as much on the purity of the lime or lime hydrate used as upon the purity of the copper sulphate.

Miscellaneous Copper Salts &c.

Copper fungicides for use in pickling wheat are represented by three brands of copper carbonate of standard strength and "Smutol," which is an oxychloride of copper, and which also complies with the standard proclaimed for copper carbonate.

Bordeaux mixture is represented by six brands in the form of dry powder, all of which comply with the standard proclaimed. "Coposil," which is a new copper mixture containing zinc, and the five brands of Burgundy or copper-soda mixture, with Schloesing's Bouillie "Bouisol" and "Bordinette," are Bordeaux substitutes used mainly in the vineyards in the northern parts of the State. They are of less importance, but nevertheless the demand entails registration.

Paris green, London purple (which are compounds of arsenic and copper, and arsenic and lime respectively), and Cheshunt compound, an ammoniacal copper compound, are of small consequence, although useful as insect poisons (Paris green and London purple) and as a soil sterilizer (Cheshunt compound being particularly useful for controlling fungi in the soil).

Lime.

Burnt lime in the "fat" or caustic condition is largely used as an insecticide by the home gardener. Its action in destroying slugs and snails is well known. The four brands registered are guaranteed to contain 80 per cent. of available lime, which means 80 per cent. in the oxide form. This is equal to the standard proclaimed.

Liquid Lime Sulphur.

There are nine registrations under the heading of liquid lime sulphur and one brand of dry lime sulphur, which is imported from the United

States of America. The brands of the concentrated liquid comply in their composition with the standard proclaimed, while the dry powder from its chemical composition may be regarded as double strength.

Dry Mix Lime and Sulphur.

The brands of dry mix lime and sulphur which are registered are not to be confused with concentrated lime sulphur. To avoid the possibility of error it would be much better to alter the name of the latter to lime sulphide or polysulphide. Dry mix lime and sulphur is simply a mechanical mixture of the two substances and is used as a fungicide in peach culture.

The mixtures registered contain from 46 to 66 per cent. of sulphur, the remainder consisting of lime hydrate with a small amount of spreader or wetting agent. The value is directly dependent upon the percentage of sulphur.

Sulphur.

The twenty-three brands of sulphur which are registered are variously stated as powdered, dusting, atomic, and colloidal. Their value is solely dependent upon the percentage of sulphur and the degree of fineness.

"Colloidal" sulphur is an improved *wettable sulphur.*

Nicotine Sulphate.

There are sixteen registrations for nicotine sulphate, which is very often loosely and incorrectly described as "Nicotine." Exactly half of the brands are of local manufacture, while the remainder are imported from the United States of America, England, Germany, and Russia.

The value of nicotine sulphate is due to its content of the alkaloid nicotine, which is one of the most powerful contact poisons ever discovered by the chemist. The percentages of nicotine in the brands registered for 1937 in Victoria are stated to be 38 and 40. Assuming nicotine as sulphate to be worth one shilling per cent. per gallon, then the brands guaranteed to contain 40 per cent. are worth two shillings per gallon more than those guaranteed to contain 38 per cent.

Oils.

Including coal-tar distillate, of which there are four brands, and the two brands of benzol emulsion, there are 47 registrations of miscible, emulsified, or straight-run oils. In recent years, there has been great improvement in the quality of oils for use as ovicides and scalecides, and, in addition, they are useful as spreaders. In the dormant period the purity of the oil is of little moment, but when growth becomes active and temperatures increase, it is of the utmost importance that the oil used as a spray should be of medicinal purity.

Miscellaneous.

Under the numerous registrations of brands registered in the miscellaneous section, there are many useful blendings of compounds used in later-day insecticide control, many of which are already proving their worth in the orchard, market garden and home garden. Although the registered analysis discloses the active principle relied on in these pest destroyers, the manufacturers, in some instances, jealously guard their formulae in not disclosing any more information than is absolutely necessary under the Act.

Dusting Powders for Vegetables.

The number of dusts registered total 91, and consist of blends of the more common pest destroyers, viz., nicotine, lead arsenate, sulphur, and a copper compound, associated with a diluent

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such as kaolin to assist in giving the "spread" necessary, and, at the same time, causing the dust to function perfectly through the dust gun.

Sheep Dips.

There are 37 sheep dips registered of which 20, or approximately 54 per cent., are arsenical and of a strength equal to the proclaimed standard. The remainder are placed under the miscellaneous section, and, excepting those which are purely phenolic, consist of mixtures of arsenious oxide and tar acids or derris extract. In some instances the dip is a blend of the three substances, but always with arsenious oxide as the base.

Weed Destroyers.

Weed destroyers are subdivided into two headings, viz., non-poisonous and poisonous. The former, of which there are seven brands registered, consist mainly of sodium or calcium chlorate, while the latter, which rely wholely on arsenic as the toxic agent, are represented by twelve brands.

A note of warning is issued to persons using weed destroyers. Sodium chlorate is a highly inflammable chemical, and every precaution should be taken to see that the manufacturers instructions are carried out, and that the clothes or overalls of the operator during spraying are not unduly subjected to contamination.

Arsenical weed destroyers, while without doubt of great value in eradicating pests in the form of noxious weeds and useless timber, are very poisonous to both human beings and stock. Care should therefore be taken to see that the poison is carefully handled, and on no account permitted to contaminate the food or water supplies whether for domestic or stock purposes.

All receptacles containing, or which have contained, the arsenical compound, should always be branded POISON in bold letters so that accidents will be avoided.

LIST OF FUNGICIDES, INSECTICIDES, VERMIN DESTROYERS, AND WEED DESTROYERS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE FUNGICIDES ACT 1935 (No. 4295), FOR THE YEAR 1937–38.

Distinguishing Name of Fungicide and/or Insecticide.	Percentage of Declared Active Constituent(s).				Manufacturer or Wholesale Dealer.
	Arsenic Pentoxide (As_2O_5) Calculated on the Dry Basis.		Acidity Calculated as Nitric. Dry Basis.	Content of Water.	
	Total.	Water Soluble.			
Arsenate of Lead (Paste).	Minimum. %	Maximum. %	Maximum. %	Maximum. %	
Aero	31·5	·25	·2	50·0	Ramsay and Treganowan Ltd., 469–477 Latrobe-street, Melbourne
Avery's	32·0	·50	·2	50·0	Avery's Garden Insecticide Co., 67 Burnley-street, Richmond
Bergers Mercury	31·0	·50	·2	50·0	Neptune Oil Co. Ltd., 532 Bourke-street, Melbourne
" " (Colloidal)	31·0	·50	·2	50·0	
Blue Bell	31·0	·50	·2	50·0	Blyth Chemicals Ltd., 31 Queen-street, Melbourne
Elephant	31·0	·50	·2	50·0	Jaques Pty. Ltd., 31 Queen-street, Melbourne
Lion	31·0	·50	·2	50·0	Orchard Sprays Pty. Ltd., 549 Church-street, Richmond
Lunevale Lethalate (Colloidal)	31·0	·04	·2	50·0	Brown and Dureau, 422 Collins-street, Melbourne
Vallo	32·0	·50	·2	50·0	Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne
Tip Top	31·0	·50	·2	50·0	Law Somner Pty. Ltd., 21–23 Elizabeth-street, Melbourne
Arsenate of Lead (Powder).					
Aero	31·5	·25	·2	..	Ramsay and Treganowan Ltd., 469–477 Latrobe-street, Melbourne
Avery's	32·0	·50	·2	..	Avery's Garden Insecticide Co., 67 Burnley-street, Richmond
Bergers Mercury	31·0	·50	·2	..	Neptune Oil Co. Ltd., 532 Bourke-street, Melbourne
Blue Bell	31·0	·50	·2	..	Blyth Chemicals Ltd., 31 Queen-street, Melbourne
Cooper's Arsinette	31·0	·50	·2	..	F. R. Mellor, 440 Elizabeth-street, Melbourne
Elephant	31·0	·50	·2	..	Jaques Pty Ltd., 31 Queen-street, Melbourne
Lion	31·0	·50	·2	..	Orchard Sprays Pty. Ltd., 549 Church-street, Richmond

LIST OF FUNGICIDES, ETC., ETC.—*continued.*

Distinguishing Name of Fungicide and/or Insecticide.	Percentage of Declared Active Constituent(s).				Manufacturer or Wholesale Dealer.
	Arsenic Pentoxide (As_2O_5) Calculated on the Dry Basis.		Acidity Calculated as Nitric. Dry Basis.	Content of Water.	
	Total.	Water Soluble.			
	Minimum. %	Maximum. %	Maximum. %	Maximum. %	
Arsenate of Lead (Powder)—continued.					
Lunevale	32·74	·253	·2	..	Brown and Dureau Ltd., 422 Collins-street, Melbourne
Ortho Standard	31·0	·50	·2	..	H. C. Pannifex and Co. Pty. Ltd., 4 Dudley-street, Melbourne
Plane	31·0	·50	·2	..	N. N. McLean Pty. Ltd., 395 Queen-street, Melbourne
Vallo	32·0	·50	·2	..	Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne
Tip Top	31·0	·50	·2	..	Law Somner Pty. Ltd., 21–23 Elizabeth-street, Melbourne
Sherwin-Williams	31·0	·50	·2	..	Lawford's Fruit Exchange Pty. Ltd., Doncaster
Calcium Arsenate.					
Avery's	40·0	..	..	..	Avery's Garden Insecticide Co., 67 Burnley-street, Richmond
Elephant	40·0	..	..	..	Jaques Pty. Ltd., 31 Queen-street, Melbourne
Lion	40·0	..	..	..	Orchard Sprays Pty. Ltd., 549 Church-street Richmond
Vallo	40·0	..	..	..	Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne
Tip Top	40·0	..	..	..	Law Somner Pty. Ltd., 21–23 Elizabeth-street, Melbourne
Sulphate of Copper (Bluestone).	%				
Commonwealth	Copper (Cu) 25·0		..	..	Commonwealth Fertilisers and Chemicals Ltd., 65 William-street, Melbourne
Cresco	,, 24·0		..	..	Cresco Fertilisers Ltd., Geelong
Macclesfield (Blyths)	,, 24·0		..	..	Blyth Chemicals Ltd., 31 Queen-street, Melbourne
,, (Jaques)	,, 24·0		..	..	Jaques Pty. Ltd., 31 Queen-street, Melbourne
,, (Neptune Oil Co.)	,, 25·0		..	..	Neptune Oil Co. Ltd., 532 Bourke-street, Melbourne, C.1
Pannifex	,, 25·0		..	..	H. C. Pannifex and Co. Pty. Ltd., 4 Dudley-street, Melbourne
,, Instant	,, 25·0		..	..	,, ,, ,, ,,
Vallo (Lump)	,, 25·0		..	..	Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne
,, (Neige Crystals)	,, 25·0		..	..	,, ,, ,, ,,
,, (Powdered)	,, 25·0		..	..	,, ,, ,, ,,
,, (Bordeaux Manufacture)	,, 25·0		..	..	,, ,, ,, ,,
Lion	,, 25·0		..	..	Orchard Sprays Pty. Ltd., 549 Church-street, Richmond
Neptune Snow	,, 25·0		..	..	Neptune Oil Co. Ltd., 532 Bourke-street, Melbourne
Faulding's	,, 24·5		..	..	F. H. Faulding and Co. Ltd., 123–25 Lonsdale-street, Melbourne
E.S.A.	,, 25·0		..	..	Elder Smith and Co. Ltd., 95 William-street, Melbourne

	Percentage Copper (Cu)	Percentage Copper (Cu) Water Soluble.	Percentage through 200-mesh Sieve.	
Basic Copper Carbonate.	%	%	%	
Cresco	50·0	·01	98·5	Cresco Fertilisers Ltd., Geelong
Sickle	52·0	Nil	99·8	Commonwealth Fertilisers and Chemicals Ltd., 65 William-street, Melbourne
Smutol (Oxychloride)	52·0	Nil	99·8	,, ,, ,, ,,
Vallo Anti-Bunt	50·0	·25	97·5	Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne

LIST OF FUNGICIDES, ETC., ETC.—*continued.*

Distinguishing Name of Fungicide and/or Insecticide.	Percentage of Declared Active Constituent(s).	Manufacturer or Wholesale Dealer.
Dry Bordeaux Mixture (Powder).		
Avery's	Copper (Cu) 12·50 %	Avery's Garden Insecticide Co., 67 Burnley-street, Richmond
Elephant	" 20·00 %	Jaques Pty. Ltd., 31 Queen-street, Melbourne
Lion	" 12·50 %	Orchard Sprays Pty. Ltd., 549 Church-street, Richmond
Vallo	" 12·50 %	Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne
Coposil	" 18·50 (3·50 per cent. zinc) %	H. C. Pannifex and Co. Pty. Ltd., 4 Dudley-street, Melbourne
Ortho (Powdered)	" 12·75 %	" " " " "
X.L.	" 13·00 %	Ramsay and Treganowan Ltd., 469–477 Latrobe-street, Melbourne
Tip Top	" 12·50 %	Law Somner Pty. Ltd., 21–23 Elizabeth-street, Melbourne
Burgundy or Copper-Soda.		
Vallo Burgundy Mixture	Copper (Cu) 12·5 %	Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne
Lion Sporocide	" 12·5 %	Orchard Sprays Pty. Ltd., 549 Church-street, Richmond
Neptune Copper Spray	" 12·5 %	Neptune Oil Co. Ltd., 532 Bourke-street, Melbourne
Blue Bell	" 12·0 %	Blyth Chemicals Ltd., 31 Queen-street, Melbourne
Elephant	" 12·0 %	Jaques Pty. Ltd., 31 Queen-street, Melbourne
Paris Green.		
Elephant	Arsenious Oxide (As_2O_3) 55·0 %	Jaques Pty. Ltd., 31 Queen-street, Melbourne
Lion	" " " 50·0 %	Orchard Sprays Pty. Ltd., 549 Church-street, Richmond
Felton, Grimwade, and Duerdin's	" " " 50·0 %	Felton, Grimwade, and Duerdin's Ltd., 342–6 Flinders-lane, Melbourne
Tip Top	" " " 50·0 %	Law Somner Pty. Ltd., 21–23 Elizabeth-street, Melbourne
Fauldings	" " " 60·0 %	F. H. Faulding and Co. Ltd., 123–25 Lonsdale-street, Melbourne
Miscellaneous.		
Yarra Cheshunt Compound	Copper (Cu) 5·0 %	J. Parsons and Co., 155 Yarra-street, Abbotsford
Fauldings (London Purple)	Arsenious Oxide (As_2O_3) 45·0 %	F. H. Faulding and Co. Ltd., 123–25 Lonsdale-street, Melbourne
Cooper's Bordinette	Copper (Cu) 12·7 %	F. R. Mellor, 440 Elizabeth-street, Melbourne
Schloesings Bouillie	" 12·7 %	Lawford's Fruit Exchange Pty. Ltd., Doncaster, Victoria
Bouisol	" 15·0 %	" " " " "
Lime.		
Neptune	Available Lime (CaO) 80 %	Neptune Oil Co. Ltd., 532 Bourke-street, Melbourne
Pannifex Bordeaux Rock	" " " 80 %	Pannifex and Co. Pty. Ltd., 4 Dudley-street, Melbourne
Vallo Selected	" " " 80 %	Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne
Lilydale Quick	" " " 80 %	David Mitchell Estate, Oliver's-lane, Melbourne

	Thio-Sulphate Sulphur.	Poly-Sulphide Sulphur.	Total Soluble Sulphur.	
	Weight in Volume.			
Concentrated Lime-Sulphur (Solution).				
Avery's	2·5 %	20·0 %	28·0 %	Avery's Garden Insecticide Co., 67 Burnley-street, Richmond
Blue Bell	2·5	20·0	28·0	Blyth Chemicals Ltd., 31 Queen-street, Melbourne
Elephant	2·5	20·0	28·0	Jaques Pty. Ltd., 31 Queen-street, Melbourne
Lion	2·5	20·0	28·0	Orchard Sprays Pty. Ltd., 549 Church-street, Richmond
Neptune	2·5	20·0	28·0	Neptune Oil Co. Ltd., 532 Bourke-street, Melbourne
Pannifex	2·5	20·0	28·0	H. C. Pannifex and Co. Pty. Ltd., 4 Dudley-street, Melbourne
Vallo	2·5	20·0	28·0	Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne
X.L.	2·5	20·0	28·0	Ramsay and Treganowan Ltd., 469–477 Latrobe-street, Melbourne
Tip Top	2·5	20·0	28·0	Law Somner Pty. Ltd., 21–23 Elizabeth-street, Melbourne
XL. Dry Lime—Sulphur Powder	2·5	40·0	55·0	Ramsay and Treganowan Ltd., 475 Latrobe-street, Melbourne

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No. 1. VICTORIA DONALD. (AA, C.R.). Born 16th March, 1935 — *Price* 40 guineas
Sire : Woodburn Peter Pan (Imp. in utero) (1504 AA). *Dam :* Victoria Rose Major (5AA). f.o.r. Werribee.
Victoria Rose Major produced 455 lb. butter-fat in 273 days, and 531 lb. in 365 days. (An AA Bull).

No. 2. VICTORIA VALHALLA (A, C.R.). Born 14th December, 1935 .. *Price* 20 guineas
Sire : Chandpara Valentine (762 AA). *Dam :* Victoria Asphodel (3008 A). f.o.r. Werribee
Victoria Asphodel produced 322 lb. butter-fat as Jr. 4 (273 days).

No. 3. VICTORIA GRATITUDE. (A, C.R.). Born 24th April, 1936 .. *Price* 18 guineas
Sire : Chandpara Valentine (762 AA). *Dam :* Victoria Gratification (3022 A). f.o.r. Werribee
Victoria Gratification produced 330 lb. butter-fat in 273 days as Jr. 2.

No. 4. VICTORIA ST. PETER. (A, C.R.). Born 29th July, 1936 .. *Price* 13 guineas
Sire : Woodburn Peter Pan (Imp. in utero) (1504 AA). *Dam :* Victoria Kosher (3914 A) f.o.r. Werribee
Victoria Kosher produced 286 lb. butter-fat in 273 days as Sr. 3.

No. 5. VICTORIA ROYAL PETER. (AA, C.R.). Born 4th August, 1936 *Price* 20 guineas
Sire : Woodburn Peter Pan (Imp. in utero) (1504 AA). *Dam :* Victoria Royal Regal (3517 AA). f.o.r. Werribee
Victoria Royal Regal has produced 271 lb. butter-fat in 273 days as Jr. 3. (An AA Calf).

No. 6. VICTORIA OHM (A, C.R.). Born 25th October, 1936 *Price* 15 guineas
Sire : Victorian Gallant (1481 AA). *Dam :* Victoria Volt (4049 B). f.o.r. Werribee
Victoria Volt produced 398 lb. butter-fat in 273 days as Jr. 4.

Prices are based on the average butter-fat production of the dam in 273 days, except in the case of progeny of heifers without completed test, the price then being 10 guineas.

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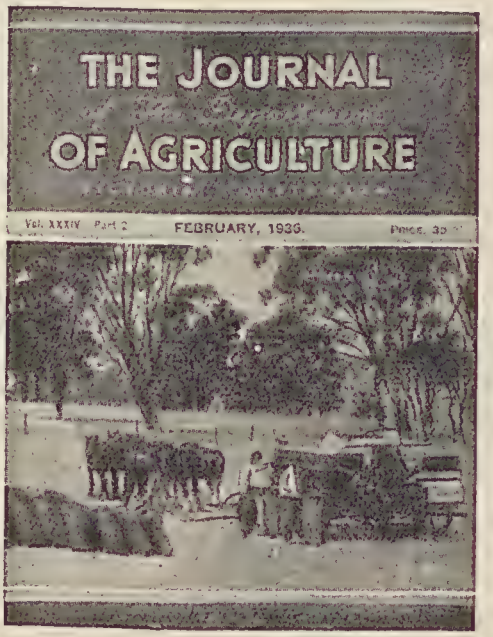

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LIST OF FUNGICIDES, ETC., ETC.—*continued.*

Distinguishing Name of Fungicide and/or Insecticide.	Percentage of Declared Active Constituent(s).		Manufacturer or Wholesale Dealer.
	Sulphur.	Calcium Hydrate.	
Lime and Sulphur (Dry Mix).	%	%	
Essen (No. 1)	62·0	..	Essen Chemical Bye Products Co. Pty. Ltd., 5 Melbourne-street, Murrumbeena
„ (No. 2)	46·0	..	
Pannifex	62·5	35·5	H. C. Pannifex and Co. Pty. Ltd., 4 Dudley-street, Melbourne
Vallo	64·0	35·6	Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne
X.L.	66·0	33·0	Ramsay and Treganowan Ltd., 469–477 Latrobe-street, Melbourne
Sulphur.	%		
Commonwealth (Dusting)	Sulphur 90·0		Commonwealth Fertilisers and Chemicals Ltd., 65 William-street, Melbourne
„ (Powdered)	„ 99·5		„ „ „ „ „
„ (Atomic Dusting)	„ 90·0		„ „ „ „ „
„ (Atomic)	„ 99·5		„ „ „ „ „
Cresco (Dusting)	„ 89·4		Cresco Fertilisers Ltd., Geelong
„ (Atomic)	„ 99·5		„ „ „ „ „
Flotox (Wettable)	„ 98·0		H. C. Pannifex and Co. Pty. Ltd., 4 Dudley-street, Melbourne
Lion (Atomic)	„ 95·0		Orchard Sprays Pty. Ltd., 549 Church-street, Richmond
Neptune (Powdered)	„ 99·0		Neptune Oil Co. Ltd., 532 Bourke-street, Melbourne
Vallo (Powdered)	„ 99·5		Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne
„ (Dusting)	„ 90·0		„ „ „ „ „
„ (Wettable)	„ 98·0		„ „ „ „ „
„ (Colloidal)	„ 50·0		„ „ „ „ „
Cooper's (Colloidal)	„ 50·0		F. R. Mellor, 440 Elizabeth-street, Melbourne
Plane (Dusting)	„ 90·0		N. N. McLean Pty. Ltd., 395 Queen-street, Melbourne
Ramtre (Dust No. 39)	„ 90·0		Ramsay and Treganowan Ltd., 469–477 Latrobe-street, Melbourne
X.L. (Atomic)	„ 75·0		„ „ „ „ „
Neptune Chemical 23871	„ 50·0		Neptune Oil Co. Ltd., 532 Bourke-street, Melbourne
Pannifex Atomic Dusting No. 31	„ 90·0		H. C. Pannifex and Co. Pty. Ltd., 4 Dudley-street, Melbourne
Cosan (Colloidal)	„ 50·0		Edgar Bell and Co. Ltd., Market-street, Melbourne
L.F.X. (Colloidal)	„ 50·0		Lawford's Fruit Exchange Pty. Ltd., Doncaster
Spregan (Colloidal)	„ 50·0		Colloidal Sulphur Pty. Ltd., 466 Swanston-street, Carlton
Howard's (Colloidal)	„ 50·0		T. A. Stevenson, 19 San Mateo-avenue, Mildura
Nicotine Sulphate.	%		
Avery's	Nicotine 40		Avery's Garden Insecticide Co., 67 Burnley-street, Richmond
Blue Bell	„ 38		Blyth Chemicals Ltd., 31 Queen-street, Melbourne
Cooper's	„ 40		F. R. Mellor, 440 Elizabeth-street, Melbourne
Elephant	„ 38		Jaques Pty. Ltd., 31 Queen-street, Melbourne
Lion	„ 38		Orchard Sprays Pty. Ltd., 549 Church-street, Richmond
Pannifex	„ 40		H. C. Pannifex and Co. Pty. Ltd., 4 Dudley-street, Melbourne
Plane	„ 40		N. N. McLean Pty. Ltd., 395 Queen-street, Melbourne
Sigma	„ 38		Sigma Co. Ltd., 562–6 Little Bourke-street, Melbourne
Vallo	„ 40		Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne
Tip Top (Black Leaf 40)	„ 40		Law Somner Pty. Ltd., 21–23 Elizabeth-street, Melbourne
Black Leaf 40 (P.D.S.)	„ 40		Producers Co-operative Distributing Society Ltd., 180 Franklin-street, Melbourne
„ „ „ (Neptune Oil Co. Ltd.)	„ 40		Neptune Oil Co. Ltd., 532 Bourke-street, Melbourne
Faulding's	„ 40		F. H. Faulding and Co. Ltd., 123 Lonsdale-street, Melbourne
L.F.X.	„ 38		Lawford's Fruit Exchange Pty. Ltd., Doncaster
Grazcos	„ 40		The Graziers' Co-operative Shearing Co. Ltd., 90–92 William-street, Melbourne
Railton's	„ 40		James Railton, 133 Elizabeth-street, Melbourne

LIST OF FUNGICIDES, ETC., ETC.—*continued.*

Distinguishing Name of Fungicide and/or Insecticide.	Percentage of Declared Active Constituent(s).	Manufacturer or Wholesale Dealer.
Tar Distillate.		
Cooper's Ovicide	Tar Oils .. 48 % Phenols .. 10 % Mineral Oil .. 20 %	F. R. Mellor, 440 Elizabeth-street, Melbourne
Vallo Ovicidal Wash	Emulsifiable Oils 89 %	Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne
I.C.I. (No. 1)	Tar Distillate .. 70 %	Ramsay and Treganowan Ltd., 469–477 Latrobe-street, Melbourne
„ (No. 2)	„ „ .. 35 % Mineral Oil .. 35 %	„ „ „ „ „
Benzol Emulsion.		
Avery's	Benzol 30 %	Avery's Garden Insecticide Co., 67 Burnley-street, Richmond
Vallo	„ 30 %	Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne
White Spraying Oil or Emulsion.		
Avery's	White Mineral Oil 60·0 %	Avery's Garden Insecticide Co., 67 Burnley-street, Richmond
Atlantic	„ „ „ 86·0 %	Atlantic Union Oil Co. Ltd., 396 Collins-street, Melbourne
Blue Bell	„ „ „ 82·0 %	Blyth Chemicals Ltd., 31 Queen-street, Melbourne
Cooper's Alboleum	„ „ „ 80·0 %	F. R. Mellor, 440 Elizabeth-street, Melbourne
Elephant	„ „ „ 82·0 %	Jaques Pty. Ltd., 31 Queen-street, Melbourne
Gargoyle	„ „ „ 82·0 %	Vacuum Oil Co. Pty. Ltd., 29 Market-street, Melbourne
Kleenup	„ „ „ 83·0 %	H. C. Pannifex and Co. Pty. Ltd., 4 Dudley-street, Melbourne
Lion	„ „ „ 80·0 %	Orchard Sprays Pty. Ltd., 549 Church-street, Richmond
Neptune	„ „ „ 85·0 %	Neptune Oil Co. Ltd., 532 Bourke-street, Melbourne
„ (Clarifol) Vallo	„ „ „ 85·0 % „ „ „ 60·0 %	Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne
„ (Prepared) Wolck	„ „ „ 89·0 % „ „ „ 83·0 %	H. C. Pannifex and Co. Pty. Ltd., 4 Dudley-street, Melbourne
White Spray	„ „ „ 85·0 %	Shell Co. of Australia Ltd., 163 William-street, Melbourne
X.L.	„ „ „ 80·0 %	Ramsay and Treganowan Ltd., 469–477 Latrobe-street, Melbourne
Tip Top	„ „ „ 80·0 %	Law Somner Pty. Ltd., 21–23 Elizabeth-street, Melbourne
L.F.X.	„ „ „ 80·0 %	Lawford's Fruit Exchange Pty. Ltd., Doncaster
Pale Spraying Oil.		
Gargoyle	Pale Mineral Oil 82·0 %	Vacuum Oil Co. Pty. Ltd., 29 Market-street, Melbourne
Neptune Palsol	„ „ „ 85·0 %	Neptune Oil Co. Ltd., 532 Bourke-street, Melbourne
Shell Pale-Spray	„ „ „ 85·0 %	Shell Co. of Australia Ltd., 163 William-street, Melbourne
Shellicide D.	„ „ „ 85·0 %	„ „ „ „ „
Vallo	„ „ „ 83·0 %	Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne
P.C.S.	„ „ „ 85·0 %	Shell Co. of Australia Ltd., 163 William-street, Melbourne

LIST OF FUNGICIDES, ETC., ETC.—*continued.*

Distinguishing Name of Fungicide and/or Insecticide.	Percentage of Declared Active Constituent(s).	Manufacturer or Wholesale Dealer.
Red Spraying Oil.		
Avery's	Red Mineral Oil 86·0 %	Avery's Garden Insecticide Co., 67 Burnley-street, Richmond
Atlantic	,, ,, ,, 89·0	Atlantic Union Oil Co. Ltd., 396 Collins-street, Melbourne
Blue Bell (Prepared)	,, ,, ,, 85·0	Blyth Chemicals Ltd., 31 Queen-street, Melbourne
Elephant (Prepared)	,, ,, ,, 85·0	Jaques Pty. Ltd., 31 Queen-street, Melbourne
Gargoyle	,, ,, ,, 85·0	Vacuum Oil Co. Pty. Ltd., 29 Market-street, Melbourne
Lion (Prepared)	,, ,, ,, 80·0	Orchard Sprays Pty. Ltd., 549 Church-street, Richmond
Neptune "A"	,, ,, ,, 85·0	Neptune Oil Co. Ltd., 532 Bourke-street, Melbourne
,, "C"	,, ,, ,, 70·0	
Shell Red Spray	,, ,, ,, 85·0	Shell Co. of Australia Ltd., 163 William-street, Melbourne
,, ,, ,, "C"	,, ,, ,, 70·0	
Tip Top (Prepared)	,, ,, ,, 80·0	Law Somner Pty. Ltd., 21–23 Elizabeth-street, Melbourne
Vallo	,, ,, ,, 86·0	Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne
X.L. (Prepared)	,, ,, ,, 80·0	Ramsay and Treganowan Ltd., 469–477 Latrobe-street, Melbourne
Harbas	,, ,, ,, 75·0 and 5·5% Tar Acid	Lawford's Fruit Exchange Pty. Ltd., Doncaster
Crude Spraying Oil.		
Neptune	Mineral Oil 85·0 %	Neptune Oil Co. Ltd., 532 Bourke-street, Melbourne
Vacuum (Prepared)	,, ,, 90·0	Vacuum Oil Co. Pty. Ltd., 29 Market-street, Melbourne
X.L. (Prepared)	,, ,, 80·0	Ramsay and Treganowan Ltd., 469-477 Latrobe-street, Melbourne
X.L.	,, ,, 100·	,, ,, ,, ,, ,,
Arsenic (Oxides).		
Vallo (White)	Arsenic (As$_4$) 75·37 %; (As$_2$O$_3$) 99·40 %	Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne
,, (Pentoxide)	Arsenic Pentoxide (As$_2$O$_5$) 83·00	Felton, Grimwade, and Duerdins Ltd., 342–6 Flinders-lane, Melbourne
Felton, Grimwade, and Duerdins (White)	Arsenic (As$_4$) 74·20 %; (As$_2$O$_3$) 98·00 %	F. H. Faulding and Co. Ltd., 123-25 Lonsdale-street, Melbourne
Fauldings (White)	Arsenic (As$_2$O$_3$) 98·00 %	
Miscellaneous.		
Vallo (Orchard Tree Bands)	Beta-Naphthol 20·00 %	Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne
Tuberol	Stearoptenes and Oleoptenes 70·00	H. C. Pannifex and Co. Pty. Ltd., 4 Dudley-street, Melbourne
Pannifex Worm Killer	Sodium Hypochlorite 6·50 %	,, ,, ,, ,, ,,
,, Harlequin Bug Killer	Mineral Oil 10·00 %; Stearoptenes and Oleoptenes 10·00 %	,, ,, ,, ,, ,,
Shirlan "R.A."	Salicylanilide 8·40	Ramsay and Treganowan Ltd., 469–477 Latrobe-street, Melbourne
,, "A.G."	,, 25·00 %	,, ,, ,, ,, ,,
Sickle Carbon Bi-Sulphide	Carbon Bi-Sulphide 99·00 %	Commonwealth Fertilisers and Chemicals Ltd., 65 William-street, Melbourne
,, Formalin	Formaldehyde 38·00 %	,, ,, ,, ,, ,,
Faulding's Formalin	,, 37·00 %	F. H. Faulding and Co. Ltd., 123–25 Lonsdale-street, Melbourne
Felton, Grimwade, and Duerdins Formalin	,, 38·00 %	Felton, Grimwade, and Duerdins Ltd., 342–6 Flinders-lane, Melbourne
Pannifex "No-damp-off"	Formalin 15·00 %	H. C. Pannifex and Co. Pty. Ltd., 4 Dudley-street, Melbourne
Champion Manurial Insecticide and Fungicide	Naphthalene 10·00 %; Stearoptenes and Oleoptenes 3·00 %; Tar Acids 1·00 %; Sulphur 3·00 %; Copper ·60 %	,, ,, ,, ,, ,,
Kill-A-Mite Manurial Insecticide	Phenol 2·50 %; Naphthlene 2·50 %; Hydrocarbon oils 4·00 %	Kill-a-Mite Co., 67–75 Roden-street, West Melbourne
Cooper's Apterite	Napthhalene 18·00 %	F. R. Mellor, 440 Elizabeth-street, Melbourne
,, Soil Sterilizer	Tar Acids 44·00 %; Neutral Tar Oils 29·00 %	,, ,, ,, ,, ,,

LIST OF FUNGICIDES, ETC., ETC.—*continued.*

Distinguishing Name of Fungicide and/or Insecticide.	Percentage of Declared Active Constituent(s).	Manufacturer or Wholesale Dealer.
Miscellaneous—continued.		
Nodew	Sulphur .. .. .. 30·00 Potassium Carbonate .. 60·00	E. H. Page, 218–220 High-street, Malvern
Ideal Slug and Snail Exterminator	Arsenic (As_2O_5) .. .. 2·00	" " " " "
Anti-pestick	Nicotine .. .. .. 20·00	" " " " "
Tip Top Kill-all	" .. .. .. ·12	Law Somner Pty. Ltd., 21–23 Elizabeth-street, Melbourne
Clensel	Oil of Citronella .. .. 2·00 Ammonia .. .. 2·30 Potash Soap .. .. 60·00	Bruce Anderson, 28 Dudley-parade, Canterbury
Ceresan	Mercury .. .. .. 1·50	Dalgety and Co. Ltd., 461–71 Bourke-street, Melbourne
Grenedeth	Nicotine .. .. .. ·58 Sulphur .. .. .. 18·19 Paradichlorbenzene .. 2·27 Essential oil res. .. .. 4·22 Naphthalene .. .. 2·60	E. H. Page, 218 High-street, Malvern, Victoria
Kilkod (Orchard Tree Bands)	Beta Naphthol .. .. 15·00	F. R. Mellor, 440 Elizabeth-street, Melbourne
Nicotine Dusting Powders.	%	
G. J. Coles and Co. Tobacco Dust	Nicotine .. .. .. ·65	G. J. Coles and Co. Ltd., 282 Little Collins-street, Melbourne
Pestend	" .. .. .. ·50	W. D. and H. O. Wills (Aust.) Ltd., 411–423 Swanston-street, Melbourne
Pestide	" .. .. .. ·50	
Plane Nicodust	" .. .. .. 2·50	N. N. McLean Pty. Ltd., 395 Queen-street, Melbourne
" " No. 3	" .. .. .. 3·00	" " " " "
" " No. 5	" .. .. .. 5·00	" " " " "
Elephant Duston No. 1	" .. .. .. 4·00	Jaques Pty. Ltd., 31 Queen-street, Melbourne
Nictar No. 2	" .. .. .. 3·00	P. Alkemade and Sons, 535 Little Lonsdale-street, Melbourne
Ramtre No. 4	" .. .. .. 2·00	Ramsay and Treganowan Ltd., 469–477 Latrobe-street, Melbourne
" No. 5	" .. .. .. 3·00	" " " " "
" No. 6	" .. .. .. 4·00	" " " " "
Vallo No. 40	" .. .. .. 2·50	Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne
Pannifex Niko Dust, No. 1	" .. .. .. 2·00	H. C. Pannifex and Co. Pty. Ltd., 4 Dudley-street, Melbourne
" " " No. 2	" .. .. .. 2·50	" " " " "
" " " No. 3	" .. .. .. 3·00	" " " " "
" " " No. 4	" .. .. .. 5·00	" " " " "
Arsenical Dusting Powders.	%	
Nictar No. 8	Arsenic Pentoxide (As_2O_5) .. 15·50	P. Alkemade and Sons, 535 Little Lonsdale street, Melbourne
Plane "A.P." No. 1	" " " .. 6·20	N. N. McLean Pty. Ltd., 395 Queen-street, Melbourne
" "A.P." No. 25	" " " .. 7·75	" " " " "
" "A.P." No. 33	" " " .. 10·20	" " " " "
" "A.P." No. 50	" " " .. 15·50	" " " " "
Ramtre No. 17	" " " .. 8·00	Ramsay and Treganowan Ltd., 469–477 Latrobe-street, Melbourne
" No. 19	" " " .. 16·00	" " " " "
Vallo "A.L." 30	" " " .. 9·60	Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne
" "A.L." 50	" " " .. 16·00	" " " " "
Pannifex Lead Arsenate No. 5	" " " .. 6·20	H. C. Pannifex and Co. Pty. Ltd., 4 Dudley-street, Melbourne
" " " No. 6	" " " .. 7·75	" " " " "
" " " No. 7	" " " .. 10·20	" " " " "
" " " No. 8	" " " .. 15·50	" " " " "
Miscellaneous Dusting Powders.	%	
Nictar No. 10	Copper (Cu) .. .. 8·75	P. Alkemade and Sons, 535 Little Lonsdale-street, Melbourne
Plane Coppodust	" .. .. 8·75	N. N. McLean Pty. Ltd., 395 Queen-street, Melbourne
Ramtre No. 14	" .. .. 8·00	Ramsay and Treganowan Ltd., 469–477 Latrobe-street, Melbourne
Arresto	Sulphur .. .. .. 9·00 Anhydrous Ferrous Sulphate 9·00 Arsenic Pentoxide .. ·40	Law Somner Pty. Ltd., 21–23 Elizabeth-street, Melbourne
Tip Top Grubbo	Hellebore .. .. 1·30 Nicotine .. .. .. ·10 Slaked Lime .. .. 75·00	" " " " "
Pannifex Copper Dust No. 9	Copper (Cu) .. .. 8·75	Pannifex and Co. Pty. Ltd., 4 Dudley-street, Melbourne

LIST OF FUNGICIDES, ETC., ETC.—*continued.*

Distinguishing Name of Fungicide and/or Insecticide.	Percentage of Declared Active Constituent(s).				Manufacturer or Wholesale Dealer.
	Nicotine.	Arsenic Pentoxide (As_2O_5).	Copper (Cu).	Sulphur.	
Miscellaneous Dusting Powders—continued.	%	%	%	%	
Elephant Duston No. 2	1·2	5·00	..	..	Jaques Pty. Ltd., 31 Queen-street, Melbourne
Nictar No. 3	2·0	15·50	..	..	P. Alkemade and Sons, 535 Little Lonsdale-street, Melbourne
„ No. 5	2·0	7·50	..	..	N. N. McLean Pty. Ltd., 395 Queen-street, Melbourne
Plane "A.P." No. 15N	2·0	4·65	..	..	
„ "A.P." No. 20N	2·0	6·20	..	..	„ „ „ „ „
„ "A.P." No. 25N	2·0	7·75	..	..	„ „ „ „ „
„ "A.P." No. 50N	2·0	15·50	..	..	„ „ „ „ „
„ "A.P." No. 25NN	3·0	7·75	..	..	„ „ „ „ „
„ "A.P." No. 50NN	3·0	15·50	..	..	„ „ „ „ „
Ramtre No. 9	2·0	8·00	..	..	Ramsay and Treganowan Ltd., 469–477 Latrobe-street, Melbourne
„ No. 52	2·0	16·00	..	..	Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne
Vallo "A.L.N."	2·0	8·00	..	..	
Ramtre No. 45	2·0	..	..	40·0	Ramsay and Treganowan Ltd., 469–477 Latrobe-street, Melbourne
Plane "A.P." No. 2	..	4·65	..	75·0	N. N. McLean Pty. Ltd., 395 Queen-street, Melbourne
„ "A.P." No. 3	..	4·65	3·00	40·0	„ „ „ „ „
„ Seed Bed	2·0	7·75	4·00	..	„ „ „ „ „
„ Coppodust with Lead Arsenate	..	7·75	8·75	..	„ „ „ „ „
„ Azurine No. 1	..	..	4·00	50·0	„ „ „ „ „
„ „ No. 2	..	..	7·00	40·0	„ „ „ „ „
„ „ No. 4	..	..	11·00	35·0	„ „ „ „ „
„ „ with Lead Arsenate	..	6·20	7·00	40·0	„ „ „ „ „
„ Tomato No. 1	..	15·50	4·00	40·0	„ „ „ „ „
„ „ No. 2	..	7·75	4·00	40·0	„ „ „ „ „
„ „ No. 3	..	15·50	..	40·0	„ „ „ „ „
Ramtre No. 21	..	6·00	6·00	30·0	Ramsay and Treganowan Ltd., 469–477 Latrobe-street, Melbourne
Vallo Tomato and Vegetable No. 1	..	16·00	5·00	40·0	Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne
„ „ „ „ No. 2	..	8·00	5·00	40·0	„ „ „ „ „
„ "A.L.B.N."	1·2	8·00	3·20	..	„ „ „ „ „
„ "A.L.B."	..	8·00	3·20	..	„ „ „ „ „
Plane Pea Mite No. 1	1·0	..	..	4·0 (Tar Oil)	N. N. McLean Pty. Ltd., 395 Queen-street, Melbourne
„ „ „ No. 2	2·5	..	..	4·0 (Tar Oil)	„ „ „ „ „
Nictar No. 1	2·5	..	..	5·0 (Refined Creosote)	P. Alkemade and Sons, 535 Little Lonsdale-street, Melbourne
Banexo	..	..	..	5·6 (Tar Oil)	David Walker, Waverley Lime Works, Lara
Cooper's Katakilla	..	..	..	3·0 (Tuba Toxin)	F. R. Mellor, 440 Elizabeth-street, Melbourne
„ Drymac	..	..	..	1·0 (Tuba Toxin)	„ „ „ „ „
				Sulphur %	
Pannifex Dual Control No. 10	2·0	4·65	..	..	H. C. Pannifex and Co., Pty. Ltd., 4 Dudley-street, Melbourne
„ „ „ No. 11	2·0	6·20	..	..	„ „ „ „ „
„ „ „ No. 12	2·0	7·75	..	..	„ „ „ „ „
„ „ „ No. 13	2·0	9·30	..	..	„ „ „ „ „
„ „ „ No. 14	2·0	15·50	..	..	„ „ „ „ „
„ „ „ No. 15	3·0	7·75	..	..	„ „ „ „ „
„ „ „ No. 16	3·0	9·30	..	..	„ „ „ „ „
„ „ „ No. 17	3·0	15·50	..	..	„ „ „ „ „
„ „ „ No. 18	..	4·65	..	75·0	„ „ „ „ „
„ „ „ No. 19	..	4·65	3·0	40·0	„ „ „ „ „
„ Seed Bed Dust, No. 20	2·0	7·75	4·0	..	„ „ „ „ „
„ Copper and Sulphur, No. 21	..	..	4·0	50·0	„ „ „ „ „
„ „ „ No. 22	..	..	7·0	40·0	„ „ „ „ „
„ „ „ No. 23	..	..	11·0	35·0	„ „ „ „ „
„ Tomato, No. 24	..	6·20	7·0	40·0	„ „ „ „ „
„ „ No. 25	..	15·50	4·0	40·0	„ „ „ „ „
„ „ No. 26	..	7·75	4·0	40·0	„ „ „ „ „
„ „ No. 27	..	15·50	..	40·0	„ „ „ „ „
„ Copper, plus L.A., No. 28	..	7·75	8·75	..	„ „ „ „ „
„ Peamite, No. 29	1·0	..	..	4·0 (Tar Oil)	„ „ „ „ „
„ Afisdust, No. 30	2·5	..	..	4·0 (Tar Oil)	„ „ „ „ „

LIST OF FUNGICIDES, ETC., ETC.—*continued.*

Distinguishing Name of Fungicide and/or Insecticide.	Percentage of Declared Active Constituent(s).		Manufacturer or Wholesale Dealer.
Blowfly Preparations.		%	
Allkon Blowfly Oil	Arsenic (As_2O_3)	1·43	Allkon Pty. Ltd., 34 Queen-street, Melbourne
	Cresol	14·00	
	Phenol	1·00	
	Tar Oils	20·00	
	Eucalyptus Oil	10·00	
	Mineral Oil	30·00	
Blo-Fli-Di	Naphthlene	7·50	The Nightingale Supply Co. Ltd., Ingle-street, Port Melbourne
	Benzol	13·70	
	Sulphur	·80	
	Cresylic Acid	8·40	
Cresco Blowfly Repellent and Healer	Glycerides of Boric Acid	65·00	Cresco Fertilisers Ltd., Geelong
	Methylated Ethyl Alcohol	35·00	
Defiance Blowfly Oil	Petroleum Oils	83·00	The Shell Co. of Australia Ltd., 163 William-street, Melbourne
	Coal Tar Derivatives	14·00	
	Essential Oils	3·00	
Immunol Blowfly Dressing	Arsenic (As_2O_3)	1·43	Hart and Co. Pty. Ltd., 84 Whiteman-street, South Melbourne
	Cresol	14·00	
	Phenol	1·00	
	Tar Oils	20·00	
	Eucalyptus Oil	10·00	
	Mineral Oil	30·00	
Osblo	Phenols	3·50	Osmond and Son (Aust.) Ltd., 35 William-street, City
	Eucalyptus	1·00	
Miscellaneous.		%	
Vallo Arsenate of Soda (for treatment of hides)	Arsenic Pentoxide (As_2O_5)	63·00	Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne
Cresco Itch Fluid	Cresols and Phenol	40·00	Cresco Fertilisers Ltd., Geelong
	Glycerol	8·50	
	Sulphur (as Sulphide)	14·70	
Younghusband's Weevil Killer	Arsenic Pentoxide (As_2O_5)	65·00	Younghusband Ltd., 94–96 King-street, Melbourne
Cooper's Powder Worm Killer	Saponaceous Vegetable Matter	33·33	F. R. Mellor, 440 Elizabeth-street, Melbourne
Allkon Special Antiseptic	Cresol	44·00	Allkon Pty. Ltd., 34 Queen-street, Melbourne
	Sulphur	8·60	
Immunol Sulphur Antiseptic	Cresol	44·00	Hart and Co. Pty. Ltd., 84 Whiteman-street, South Melbourne
	Sulphur	8·60	

Distinguishing Name of Vermin Destroyer (Sheep Dip).	Percentage of Declared Active Constituent(s).	Manufacturer or Wholesale Dealer.
Sheep and Cattle Dips (Arsenical).		
Cooper's Powder	Conforms with standard	New Zealand Loan and Mercantile Agency Co. Ltd., 538 Collins-street, Melbourne
Cresco Fluid	" "	Cresco Fertilisers Ltd., Geelong
Edward's Powder	" "	Primary Producers Chemicals Pty. Ltd., 430 Little Collins-street, Melbourne
Little's Powder	" "	Wilcox Mofflin Ltd., 499 Little Collins-street, Melbourne
Quibell's Powder	" "	Dalgety and Co. Ltd., 461–471 Bourke-street, Melbourne
Vacdip	" "	Vacuum Oil Co. Pty. Ltd., 29 Market-street, Melbourne
Sickle Powder	" "	Commonwealth Fertilisers and Chemicals Ltd., 65 William-street, Melbourne
Thomas' Carbolised	" "	The Thomas Sheep and Cattle Dips Pty. Ltd. 47 Adam-street, Burnley
Vallo	" "	Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne
Atlantic	" "	Atlantic Union Oil Co. Ltd., 396 Collins-street, Melbourne
Vetsol	" "	A. H. McDonald and Co. Pty. Ltd., 570 Bridge-road, Richmond, E.1
Little's Tripolvos Powder	" "	Wilcox Mofflin Ltd., Herty House, 499 Little Collins-street, Melbourne
Lan-o-leen	" "	The Graziers' Co-op. Shearing Co. Ltd., 90–92 William-street, Melbourne
Young's Powder	" "	Strachan and Co. Ltd., Geelong
" Jason Liquid	" "	" " "
Osmond's Viper Powder	22·5 per cent. Arsenious Oxide	Osmond and Son (Aust.) Ltd., 35 William-street, Melbourne
United	Conforms with standard	The Australian Estates Co. Ltd., 114–116 William-street, Melbourne
Dinkum Fluid	" "	Dytic Products Pty. Ltd., 4 Roden-street, Melbourne
Dytic Powder	" "	" " " " "
Dytic Fluid	" "	" " " " "

LIST OF FUNGICIDES, ETC., ETC.—*continued.*

Distinguishing Name of Vermin Destroyer (Sheep Dip).	Percentage of Declared Active Constituent(s).	Manufacturer or Wholesale Dealer.
Miscellaneous Dips.	%	
Allkon	Arsenic (As_2O_3) 41·80; Sulphur as Sulphide 1·40	Allkon Pty. Ltd., 34 Queen-street, Melbourne
Cooper's Quickacting Powder	Derris Ext. (Crude) 4·60; Arsenic (As_2O_3) 22·00; Rotenone ·70	New Zealand Loan and Mercantile Agency Co. Ltd., 538 Collins-street, Melbourne
„ Milk Oil Fluid	Phenol and Cresol 18·00	„ „ „ „ „
Hart's Immunol Fluid	Arsenic (As_2O_3) 20·00; Cresol 32·00	Hart and Co. Pty. Ltd., 84 Whiteman-street, South Melbourne
„ „ Super	Arsenic (As_2O_3) 22·40; Cresol 30·70; Oleo-resin (Derris) ·74	„ „ „ „ „
Kymac	Cresols 58·00; Rotenone 1·34	Younghusband Ltd., 94–96 King-street, Melbourne, and Geo. Hague and Co. Pty. Ltd., Geelong
Little's Liquid	Arsenic (As_2O_3) 12·20; Tar Acids 13·00	Wilcox Mofflin Ltd., 499 Little Collins-street, Melbourne
„ „	„ „ 19·00	„ „ „ „ „
Quibell's Liquid	„ „ 18·00	Dalgety and Co. Ltd., 461–471 Bourke-street, Melbourne
Vallo Fluid	Tar Acids 20·00	Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne
Estates' Special Fluid	Arsenic (As_2O_3) 22·40; Cresol 30·70; Oleo-resin (Derris) ·74	Australian Estates and Mortgage Co. Ltd., 114 William-street, Melbourne
Young's Red Label Paste	Phenols 24·00; Tuba-toxins, &c. 19·50	Strachan and Co. Ltd., Geelong
Osmond's Viper Fluid	Arsenic (As_2O_3) 15·00; Phenols 18·00	Osmond and Son (Aust.) Ltd., 35 William-street, Melbourne
Osmond's Zenos	„ „ 18·00	„ „ „ „ „
Edward's Improved Fluid	Tar Acids 18·00	Primary Producers' Chemicals Pty. Ltd., 430 Little Collins-street, Melbourne
Sickle Double Action	Arsenic (As_2O_3) 21·00; Rotenone, &c. ·70	Commonwealth Fertilisers and Chemicals Ltd., 65 William-street, Melbourne
Hart's Immunol Paste	Arsenic (As_2O_3) 41·80; Sulphur 1·40; Derris Ext. 4·60	Hart and Co. Pty. Ltd., 84 Whiteman-street, South Melbourne

Distinguishing Name of Weed Destroyer.	Percentage of Declared Active Ingredients.	Manufacturer or Wholesale Dealer.
Weed Destroyers (Non-poisonous).	%	
Cresco Sodium Chlorate	Sodium Chlorate 98·0	Cresco Fertilisers Ltd., Geelong
Felton, Grimwade, and Duerdins Sodium Chlorate	„ „ 99·0	Felton, Grimwade, and Duerdins Ltd., 342–6 Flinders-lane, Melbourne
X.L. Sodium Chlorate	„ „ 99·5	Ramsay and Treganowan Ltd., 469–477 Latrobe-street, Melbourne
Weedex 25%	Calcium Chlorate 22·0; Chloride 71·0	Commonwealth Fertilisers and Chemicals Ltd. 65 William-street, Melbourne
Weedex 35%	Chlorates of Calcium and Sodium 35·0; Chloride of Calcium 60·0	„ „ „ „ „
Fauldings	Sodium Chlorate 99·0	F. H. Faulding and Co. Ltd., 123–25 Lonsdale-street, Melbourne
Pannifex 16/16 Lawn	Ammonia 16·0; Potash 16·0	H. C. Pannifex and Co. Pty. Ltd., 4 Dudley-street, Melbourne
Weed Destroyers (Poisonous).	%	
Avery's	Arsenic (As_4) 60·6	Avery's Garden Insecticide Co., 67 Burnley-street, Richmond
Bell's Dandy Blue Weed Killer	„ „ 55·0	Rocke, Tompsitt, and Co. Pty. Ltd., 292–298 Flinders-street, Melbourne
Cooper's Weedicide*	„ „ 27·0	F. R. Mellor, 440 Elizabeth-street, Melbourne
Edwards*	„ „ 20·0	Primary Producers Chemicals Pty. Ltd., 430 Little Collins-street, Melbourne
Elephant	„ „ 60·6	Jaques Pty. Ltd., 31 Queen-street, Melbourne
Globe	„ „ 59·0	Rocke, Tompsitt, and Co. Pty. Ltd., 292–298 Flinders-street, Melbourne
„ Weed and Scrub*	„ „ 21·0	„ „ „ „ „
Vallo Weed, Scrub, and Tree	„ „ 60·6	Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne
„ Arzeen	„ „ 60·6	„ „ „ „ „
„ Liquid Arzeen*	„ „ 36·3	„ „ „ „ „
Hardy's Weed Killer*	„ „ 20·0	Hardy's Weed Killer Pty. Ltd., 422 Collins-street, Melbourne
Pannifex Arsenical, No. 33	„ „ 20·0	H. C. Pannifex and Co. Pty. Ltd., 4 Dudley-street, Melbourne

* In liquid form.

Orchard and Garden Notes

By Edward E. Pescott, F.L.S.

The Flower Garden.

TO provide for a display of flowers during winter and early spring, first of all the beds should be well dug over and a supply of animal manure or a good dusting of blood and bone dug into the soil. The surface should be given a thorough dusting of lime, unless any plants to be set out are lime-haters.

Chief among winter and spring flowers are stock, wallflower, aquilegia, antirrhinum, and primula. Seedlings should be set out at even spaces, and should be watered after planting, but care is necessary to see that too much water is not applied; wallflowers, stocks and antirrhinum will quickly wilt if over-watered.

All autumn-planted seedlings must be closely watched for wilt, which is a serious fungus pest. If any plants wilt, they should be pulled up and burned. Lime should be withheld, and the whole bed dusted with copper carbonate, to check any advance of the pest.

In shaded spots where they can be protected from frosts in early spring, cinerarias may be set in a manured bed. The plants will flower in early and late spring.

The Orchard.

The practice of green manuring in orchards is not given sufficient attention. If orchardists were as careful in this matter as are vine-growers, their trees and their crops would be greatly improved.

As a rule crops should be sown in autumn, before the soil has cooled down. This will allow the plants a good growth before winter. Legumes are usually chosen; these include all clovers, field beans, tares and tick beans. Combinations such as tares and tick beans, oats, tares and beans, and so on, are sometimes sown. When tares are included, they are usually sown with a strong growing plant which will give them some support.

Antirrhinums.

After ploughing, the crop should be sown with one cwt. of super. and bone per acre, if necessary.

Before sowing the green manure crop, all refuse fruit should be collected and destroyed; all bandages should be removed from the trees and burned, and all leaves of peach, apricot and plum trees that had been affected with shot-hole or rust should be burned.

The Vegetable Garden.

Celery plants should be sprayed with lime sulphur if celery spot appears. As parsnips are liable to be affected with this fungus, they, too, should be sprayed; a strength of 1 in 35 will be sufficient to check the trouble.

Cabbage and cauliflower crops should now be advanced into good growth. Soil should be "hilled" around the plants so as to encourage an increased root system. Should the larvae of cabbage moth cause any trouble, the crops may be dusted with arsenate of lead powder.

Control of pests by dusting is quite modern, and the work is far more easily done in this way than by spraying, and is more effective. The plants should be treated in their early stages of growth, and dusting must cease, as soon as the hearts or heads begin to form.

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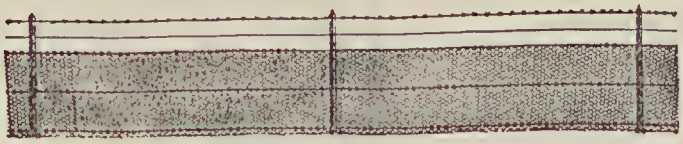

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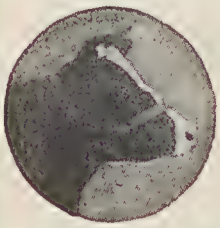

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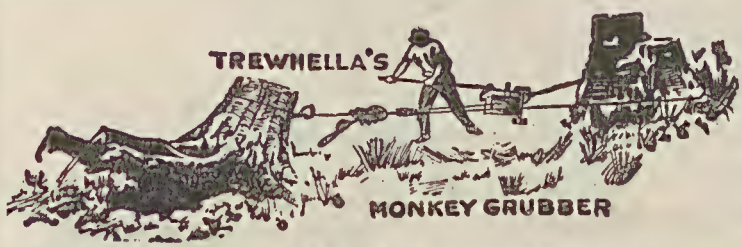

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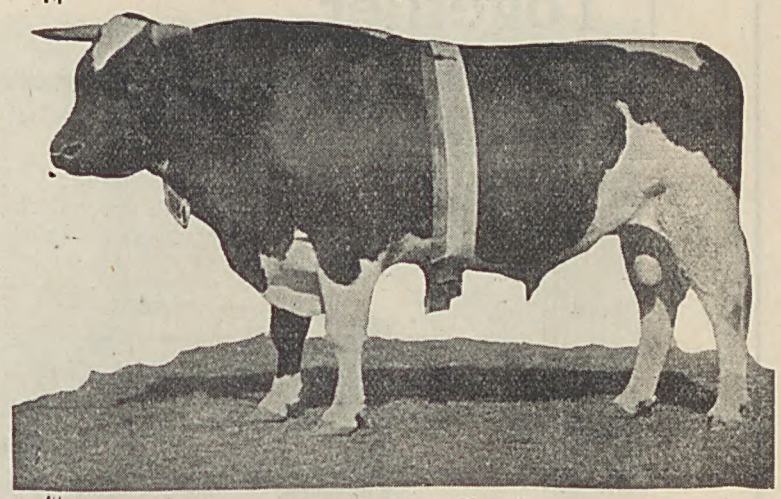

Victoria Joyous Mercedes

Dam:
Victoria Joybell, produced 15,387 lb. milk, 3·67 % test, 565 lb. butter-fat in 273 days, twice-a-day milking.

Daughters:
His eight (8) first-calf daughters have averaged 9,930 lb. milk, 3·73 % test, 370 lb. butter-fat in 273 days on first lactations.

INSPECTION
- - INVITED - -

1. VICTORIA CHOIR BOY (C.R.) *Born 13th June, 1935*
Sire: Victoria Joyous Mercedes (985) *Dam:* Victoria Chorus Girl (3759)
Victoria Chorus Girl produced 510 lb. butter-fat in 273 days as Sr. 3 year old.
Price: **20 guineas** f.o.r. Werribee

2. VICTORIA DUCE (Vol. 14) *Born 20th December, 1935*
Sire: Victoria Double Top (1354) *Dam:* Victoria Ilkedes (3763)
Victoria Ilkedes has produced 490 lb. butter-fat as Jr. 4 year old in 273 days.
Price: **17 guineas** f.o.r. Werribee

3. VICTORIA MIKADO (C.R.) *Born 1st February, 1936*
Sire: Victoria Joyous Mercedes (985) *Dam:* Victoria Streaky Patch (3769)
Victoria Streaky Patch produced 438 lb. butter-fat in 273 days as Sr. 3.
Price: **16 guineas** f.o.r. Werribee

4. VICTORIA SINGING LAD (C.R.) *Born 10th October, 1936*
Sire: Rupertswood Inka Jo. (Vol. 13) *Dam:* Victoria Songstress (3768)
Victoria Songstress produced 468 lb. butter-fat in 273 days.
Price: **17 guineas** f.o.r. Werribee

For further particulars apply to

The Director of Agriculture, Melbourne,
or The Manager, State Research Farm, Werribee.

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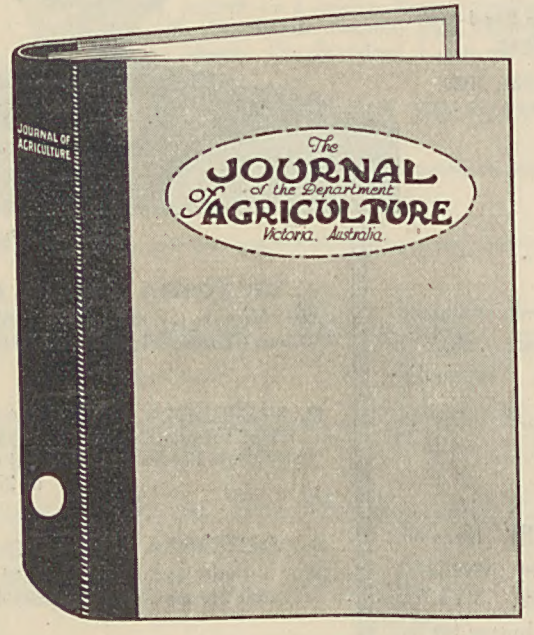

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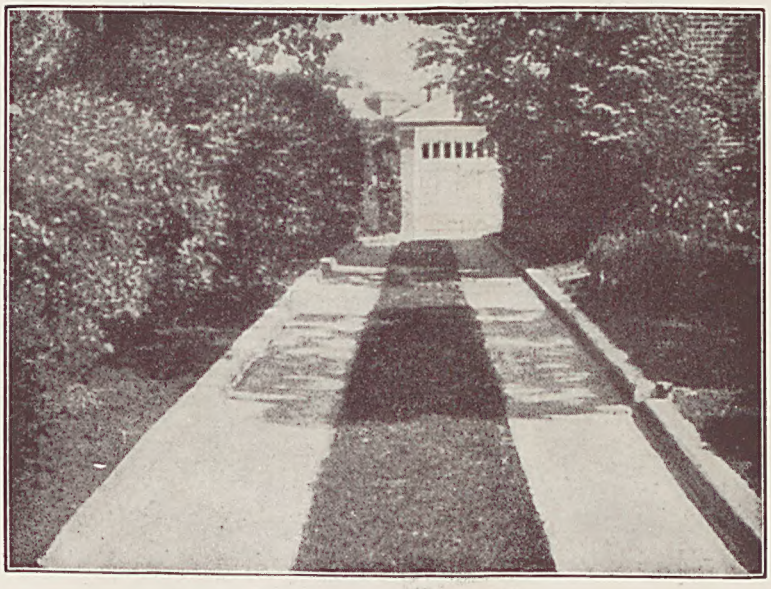

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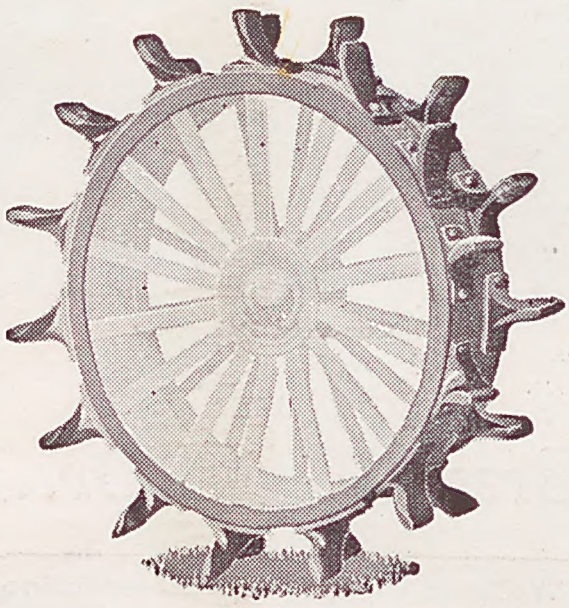

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